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MYSTERY breed

Chickens and other poultry members come in all sizes, shapes, colors and personalities. Nearly 400 recognized breeds and varieties of poultry exist, including large-fowl and bantam chickens, ducks, geese, turkeys and guinea fowl. Using our illustration and a few selected hints, can you guess which breed we have depicted here? Find out the answer on page 64.

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HINTS

- This striking hen lays **dark-brown eggs** year-round.
- To create them, breeders **crossed Asiatic chicken breeds**, including the Langshan, Cochin, Brahma and Maleier.
- The iridescent appearance of this breed's plumage comes from the **lacing of bronze on the greenish-black feathers of the neck, head and back** and the lacing of greenish-black on the bronze feathers of the saddle and breast.
- The breed isn't **named after the barn** but a region of the Netherlands, an area famous for its poultry.

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Food Balance

Most every animal-keeper knows the value of treats, and chicken-keepers are not an exception! Treats can provide a great bonding experience between poultry and humans and can even be used for training.

For example, researchers wanting to better understand chicken behavior and cognition train chickens to peck at a certain object by rewarding them with a treat. Similarly, backyard chicken owners can train chickens to come when called by using treats as a reward. This can be a great way to consistently get backyard flocks to return to the coop at night.

For success in training, positive reinforcement tactics with treats is key. Just like with dogs, punishment-based training methods are counterproductive. This is especially true for chickens since they have reactive prey instincts.

Chickens have a behavioral and physiological response when they are anticipating getting a treat. This anticipation of consuming a treat is linked to the reward centers within their brain. One experiment ("Effects of haloperidol, a dopamine D2-like receptor antagonist, on reward-related behaviors in laying hens," Moe et al., *Physiology & Behavior*, 2011) found that chickens increase their head movement and remain alert, with their head and neck stretched, when they anticipate receiving a treat.

In fact, the more desirable the treat (for example, if the treat includes mealworms or insects vs whole wheat) the more they showed head movement, as shown in another experiement ("Effects of signalled reward 482 type, food status and a μ-opioid receptor antagonist on cue-induced anticipatory behaviour in 483 laying hens [*Gallus domesticus*]," Moe et al., *Applied Animal Behavior Science*, 2013).

NUTRITION & TREATS

Even though poultry feed is considered a complete and balanced diet, treats can be a very beneficial supplement. Poultry feeds are formulated based on the protein, fat, carbohydrate, vitamins and minerals of various ingredients. Poultry treats can provide additional, more flexible nutrition.

Supplementing your flock with treats gives you the ability to tailor their diet based on what they need most. For example, most chicken-approved kitchen scraps can be a great treat for a flock. However, fresh fruits, vegetables and herbs have limited nutritional value because of their high-water content.

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As omnivores, chickens love bugs and insects.

These types of fresh food scraps can help keep a flock hydrated, but oftentimes, the water content dilutes most of the nutritional benefit. Dried fruits and vegetables are more shelf stable than fresh, meaning they're more nutrient-dense and provide a higher amount of nutrients, especially vitamins and minerals.

Insects are highly beneficial and a poultry favorite, which is why they're often included in treats! Birds are omnivores and love snacking on insects — those they catch in the coop and garden and the dried insects found on store shelves.

In general, most insects and their larvae are a good source of protein and fat and are highly digestible, although they can have a varying nutrient profile. For example, the macronutrient (carbohydrates, fat) profile and amino acid digestibility between black solider fly larvae and mealworms are similar. However, black solider fly larvae tends to have a much higher amount of calcium and a slightly lower level of crude protein than mealworms.

When it comes to insect treats, safety and sustainability should be taken into consideration as well. For example, black solider fly larvae are more sustainable to grow than other insects. They have a mechanism in which enzymes are secreted to aid in the digestion and absorption of nutrients, allowing their growth cycle to be relatively shorter and more efficient.

Another factor that effects the safety and nutrient value of these insects is how they are grown and processed. If the feed fed to black solider fly larvae contains heavy metals, this can lead to heavy metal accumulation in the larvae. Heavy metal poisoning affects the health of our chickens, and these minerals can also potentially contaminate their meat and eggs.

Salmonella can also be a concern with dried insects. When salmonella was introduced during mealworm production, it resulted in contamination and remained within the larvae through processing, as shown in "Salmonella Typhimurium Level in Mealworms (*Tenebrio molitor*) after Exposure to Contaminated Substrate," Jensen et al., *Frontiers in Microbiology*, 2020). Selecting insects grown in countries that have strict feed and treat safety regulations, such as the United States, help to ensure the insects are safe for our birds to eat.

MORE THAN CORN

Offering treats to poultry isn't a novel idea; however, the variety of options for the type of treat is! Historically, scratch grain was considered the original poultry treat. In the early 20th century, poultry were primarily fed by scattering grain on the ground thus the term scratch grain. Generally speaking, the term referred to corn, wheat and other grains.

Now, because of the progress of nutritional science and poultry nutrition, treats have come a long way. Scratch grain is still available as a treat, but the definition has expanded to include a variety of ingredients such as corn, barley, oats, wheat and more. These ingredients are high in carbohydrates but may not necessarily be balanced in other nutrients, such as protein and minerals.

The carbs in scratch grain are a good energy source for our birds, especially with colder temperatures, but the inclusion of other ingredients, such as insects, can increase the nutrient value and take the treat from good to great! A balanced blend of ingredients such as black solider fly larvae, mealworms, dried fruits and vegetables, and/or herbs can offer the most nutrient dense option and provide the best value.

Researchers and backyard poultry-keepers agree that chickens enjoy treats, especially highly palatable ones! They're an effective, positive way to train poultry while also offering a solution for boredom and fun interaction. However, like most things, moderation is key when feeding treats, and treats should not make up more than 10% of a flock's diet.

To best support your flock, consider supplementing their diet with treats that offer functionality and nutritional value. You may even discover that they prefer different treats during different times of year or based on what's happening in their environment. When you find the right treats for your flock, everyone — keepers and birds alike — will be that much happier and healthier.

Mikayla Baxter, Ph.D., is the Digestive Health Products Manager at Perdue Animal Nutrition.

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Incubation Issues

Hatching eggs seems straightforward, and it's a simple project — so long as you follow a few simple rules to ensure success. "Hens have been doing this for thousands of years! Why can't I get it right?"

Beth, a fitness instructor in North Dakota, has been following my chicken antics online for years. She credits my flock for inspiring her to start one of her own and is now mom to a dozen Easter Eggers and Buff Orpingtons in addition to her teenage son. And this spring, Beth decided to try her hand at hatching eggs.

She thought it would be a fun thing to share with her son as well as a way for her flock to sustain itself. Her first attempt, however, resulted in not one egg hatching. Beth waited 25 days, then 28 days. At 30 days, she threw away the eggs, sanitized her incubator, double-checked the humidity and temperature settings, and made sure the egg-turning function was operating correctly. She then started over with a dozen new eggs.

At 21 days, one Orpington egg emitted peeping sounds, but the chick within never breached the shell. For her third try, Beth stuck to just Orpington eggs, but the results were the same as the first. For her most recent try, Beth invested in a candler, then tried with a mix of eggs.

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Prepare the incubator about one week prior to the arrival of fertilized eggs.

Everything looked great at seven days. At 14 days, however, every egg had long stopped developing. Exasperated, Beth finally reached out to me.

WHEN YOU'RE DOING EVERYTHING RIGHT

It seemed to me that Beth was doing everything right to properly incubate her flock's eggs. She guaranteed that her rooster was quite active with the ladies and that she had thoroughly read all the instructions that came with her incubator. She had even contacted the manufacturer to clarify a couple of things.

She's set the eggs pointy side down, placed the incubator in a low-traffic area of her home, and made sure the machine was set at the proper temperature and humidity. The only time the eggs were ever handled was when she candled them on her fourth attempt and when she had to dispose of them.

"They're not even old eggs," she said. "I'm literally taking them from the nest box and putting them into the incubator. Could that be it?"

AGE DOES MATTER

Some poultry scientists advise flock owners to let fresh eggs rest for three to 10 days after hatching before incubating them. Others believe the best success rates come from hatching the freshest possible eggs.

Similarly, some experts advise not to use eggs that are older than 10 days. Others consider two weeks past lay the maximum age for hatching eggs.

I have had success with eggs fresh from the hen as well as from properly stored, 2-week-old eggs. Because Beth's eggs were coming directly from her nest boxes, age of the eggs wasn't the issue. And the flock was less than 3 years old, so the age of the laying hens was also not an issue.

SUCH A THING AS TOO CLEAN

Beth's conundrum became clear when I confirmed how frequently she was handling the hatching eggs. She reiterated that only she handled the eggs:

- putting them in the incubator
- candling them
- throwing them away

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The only other time she touched them was when she collected them and when she cleaned them for the incubator.

Aha! It turned out that, in addition to sanitizing her incubator, Beth was also carefully scrubbing every single speck of dirt and dust off her eggs with a little scrub brush she'd bought just for this purpose. She seemed quite stunned when I gently informed her that all that scrubbing was removing the all-important bloom — the protective coating that seals the eggshell's pores to keep moisture in and bacteria out.

Without this layer, the porous shell could be and most likely was penetrated by harmful bacteria that sabotaged her incubation attempts.

THE SCOOP ON SOIL

It's easy to understand why poultry keepers would assume a soiled egg would need to be cleaned prior to being incubated. Dirt, droppings and even egg splatter from neighboring broken eggs become breeding grounds for bacteria inside a hot, humid incubator.

These microbes can then penetrate the hatching eggs, killing embryos and, occasionally, even causing the hatching eggs to explode inside the incubator. Because of this, soiled eggs should never be chosen for incubation.

However, there is soiled and then there is *soiled*. An egg with

Prior to incubation, a good rule of thumb is that a fertilized egg can be stored for a maximum of seven days in a cool room kept at a steady 55 to 60 degrees Fahrenheit.

a couple of dirt or poop spots — nothing totally an area bigger than a dime — can be gently cleaned with a dry cloth or paper towel. Never use a wet cloth or towel, sandpaper or anything abrasive. These will remove both the debris and the bloom.

Beth is now on her fifth attempt to hatch eggs. She now regularly changes the bedding in her nest boxes, which results in cleaner eggs for both eating and hatching.

This time around, she carefully selected the cleanest eggs her hens laid for incubating. Her 14th-day candling showed all 12 eggs developing healthfully, and she and her son are looking forward to finally having a bunch of baby peeps joining them soon.

Ana Hotaling and her husband, Jae, own FMA Farms, a heritage-poultry farm in southeast Michigan. Follow her adventures at www.facebook.com/FMAFarms.

Chicks will typically hatch at day 21.

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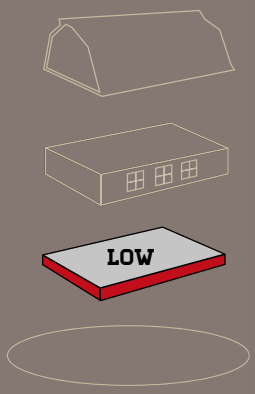

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CENTRAL LIFE SCIENCES

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Regarding Rodents

Mice and rats are more of a nuisance than a true threat to adult chickens. While they're certainly capable of killing chicks, only a very large, very hungry and very motivated rodent will attempt to kill an adult chicken. Rats and mice tend to view the coop as a warm, dry shelter in which to make a nest, particularly if there is chicken feed to feast on nearby. To get rid of them, the first step is to not attract them.

ELIMINATE SOURCES OF FOOD & WATER

To begin to eradicate rodent, stop providing a restaurant service. Remove feeders and waterers from your coops and runs at dusk and clean up any spilled rations.

Store your feed in tightly lidded metal containers. You can also use heavy-duty, lidded plastic totes, but you will need to inspect these regularly as rodents can chew through plastic.

If you give your flock kitchen scraps, clean anything left uneaten before dark or the rodents will find it. Do not leave pressed seed or suet cakes or other "boredom busters" in any area your chickens frequent, as these will attract the rodents as well.

Similarly, don't leave pet food or wild bird feeders outside overnight. The rodent's keen sense of smell will quickly locate these.

If you store your household garbage outside, keep it inside your garage instead. Regardless of location, keep your trash secure by storing it in rodent-proof containers. If you have fruit trees, pick ripe fruit frequently and do not leave fallen fruit on the ground.

Collect your hens' eggs daily to remove that source of food as well. Finally, do not

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Make sure that any holes in the coop that mice can gain access through are sealed. Note: Mice can squeeze through a hole the size of a pencil eraser!

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Chickens don't attract rodents; food sources do. To keep rats and mice at bay, store all chicken feed in a secure container.

leave sprinklers on at night as these become a source of water for rodents. Check your garden hoses for any leaks that might create standing water from which rats can drink.

WEED OUT POTENTIAL NESTING MATERIALS & HIDING PLACES

While rodents may use their own fur to line their nests, they'll happily utilize anything at hand.

Avoid using straw or lawn clippings in your chicken runs. Not only can rats hide in these, but they'll carry it down to their nests as lining.

Keep your lawn mowed to eliminate tall grasses where rodents can hide, and be sure to trim or weed whack any plant growth taller than 12 inches near your coops, your run fence and other buildings.

Dryer lint blown out of vents is another favorite, so make certain to regularly check these openings. If possible, close them off with quarter-inch hardware mesh.

Eliminate piles of junk on your property. Rodents love the hiding places clutter creates. Rats also frequently turn piles of firewood into dens, so keep your logs neatly stacked, at least 18 inches off the ground and well away from walls and fences.

If roof rats are a problem, trim any branches that overhang your coops and runs or touch overhead wires or other trees. And prune back any ivy growing on the walls or branches that drape down to the ground.

EVICTING RESIDENT RODENTS

All of these precautions will make your property less inviting to rodents, but you still have to deal with the ones that are already in residence.

Snap traps are an effective counter measure to a rat infestation. If you have identified burrow entrances or runways, set snap traps up near these holes and heavily traveled areas.

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Peanut butter, oatmeal and pet food can be used as bait, but we have had great success using chicken feed. Be certain that you do not set up the traps until your flock is locked up for the night and your pets are inside. A snap trap can seriously injure or even kill a curious animal.

Like other sources of food, remove the traps during the daytime, preferably before a chicken decides to investigate it.

Electronic traps are also highly effective. These usually run on batteries, lure a rat in via ultrasonics, then zap it once it is inside.

Somewhat less effective are glue boards, which are similar to fly paper except for rodents. These work well for mice, but the larger rat can wrest itself out of this sticky situation.

SET COLONY TRAPS

Colony traps are multicatch traps, meaning they can hold more than one mouse at a time. The small metal boxes have an entrance hole on either end that contains a one-way door, meaning mice enter and can't get out. The nice part about them is they're on duty 24/7 without maintenance, except removing trapped mice. Again, no bait is needed if placed against the wall in the normal travel route. All mice caught in a colony trap will be alive if you check them frequently, so you will need a plan for dealing with them. Mice are not at all wary of these devices and will enter them readily.

Colony traps are like small cages. Again, the rats will hesitate entering them at first.

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Keep the coop clean to dissuade rodents looking for an easy meal.

Rodent Disposal

Disposing of a rodent requires extra precautions, due to the diseases and parasites it carries on its fur and skin. Use disposable gloves to pick up the body, then double bag it in plastic bags and place it in your garbage bin.

Do not leave a rodent in a trap for long, as it will draw insects that can spread any diseases the rat carried. Also, the carcass can end up a source of food for other rats and any scavengers you have in the area.

My experience is once one finally goes in, they all go, but it might take days or even weeks.

APPLY RODENTICIDES

Poisons are often a last resort for the chicken-keeper and should be used with caution around your livestock or poultry. Always place poisons in containment boxes; in most areas, this is the only legal way to use them. Make sure the boxes are locked in some manner. Many of them snap shut and require a tool to open, while others need to be locked with a screw or similar fastener. This will keep them from opening and exposing the contents to nontarget animals.

I prefer poison blocks over pellets, as the blocks can be fastened to the inside of the box and are more difficult for rodents to remove. Pellets can easily be removed from the boxes, which is hazardous to your flock.

When using any rodenticide, don't continually use the same one over and over, as rodents will eventually build up an immunity to the chemicals. If a rodent snacks on a poison block and gets a bellyache and then recovers, it's now immune to that particular cocktail, so change it up frequently. Also, keep the boxes maintained — don't run out of poison — and keep them well fed.

Be aware of secondary poisoning to domestic animals, such as cats and dogs, and in wildlife that might consume poisoned rodents. Secondary poisoning is rare, but it can happen.

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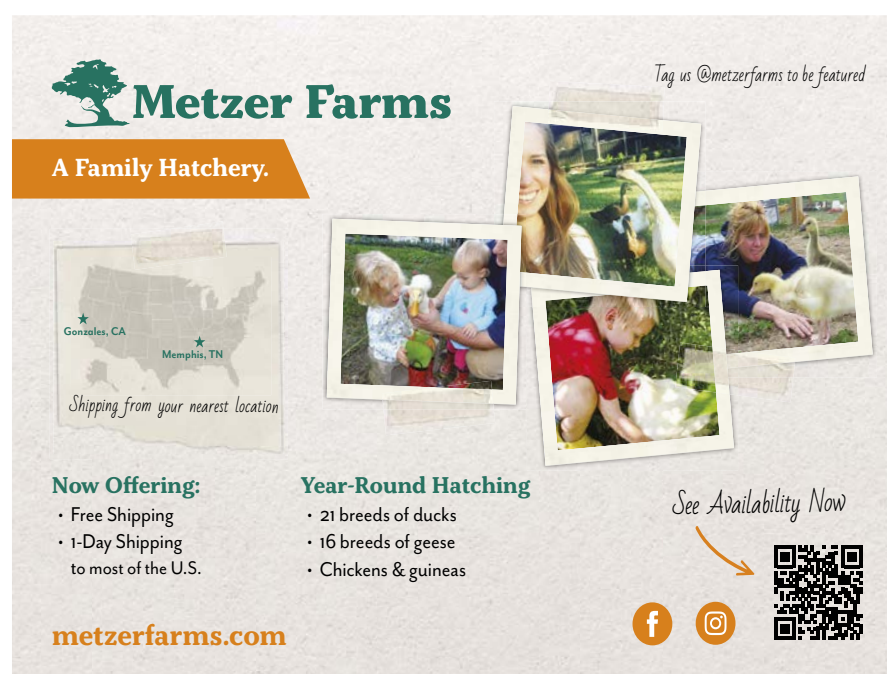
A rat can produce more than 40 droppings per day and a gallon or more of urine per year, while a mouse can produce more than 80 droppings per day and more than a quart of urine per year.



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Fermenting your flock's feed will make it easier to digest. This in turn will improve the feed consumption-to-production ratio, saving you money.

Ferment YOUR FEED

Provide your flock with an immune-boosting addition to their daily meal.

ARTICLE & PHOTOS BY HEATHER LEVIN

Imagine someone comes to your door selling a brand-new chicken feed they developed. This feed, they explain, is loaded with vitamins, minerals and immune-boosting probiotics that leads to vibrant, healthy birds. Because the chickens have access to better nutrition, they eat less which, in turn, saves you money.

At this point, you might be rolling your eyes and inching the door closed. But, wait, there's more!

This salesperson goes on to say that because your chickens digest this new feed more effectively, they produce fewer and much drier droppings. So, you save time on coop cleanup every week. Switching to this new feed, they claim, will even help your chickens lay more eggs. And, those eggs are better quality, with thicker shells and more nutrients.

You're now ready to close the door on this snake-oil salesman because — after all — what kind of feed could do all that?

But this magical feed is already sitting out in your barn — no salesman needed. All you have to do to give your flock all these benefits is to ferment it.

The probiotics contained in fermented feed promotes good gut health.

Money Savers

Use these tips to save money on feed costs.

FREE-RANGE: While everyone can't do this, allowing your flock to free-range means they'll supplement their diet with bugs and grass instead of commercial feed.

PROVIDE FORAGE: If you can't free-range your flock, provide forage in the run. Grass clippings, vegetable and fruit scraps, and pasture weeds will be a tasty addition for your birds and help reduce their feed intake.

ASK AROUND: Another option is to feed your flock less than perfect produce. Contact local farmers, or even talk to the produce manager at your grocery store, and ask if you can pick up damaged produce once a week. Just make sure the produce isn't moldy or rotten.

GROW YOUR OWN: Start a garden to supplement your chickens' diet. Your flock will love feasting on fresh tomatoes and zucchini all summer long.

CONTROL RODENTS: Feeding your flock free-choice can lead to a major rodent infestation. Limit feed only to what your flock will eat in a day, and employ a barn cat to control mice and rats.

Fermentation is the same technique used to make wine, beer and sauerkraut. You can ferment chicken feed the same way your local brewery creates your favorite brew and give your flock an impressively long list of health benefits in the meantime.

I do a lot of fermenting on my homestead. My family makes our own probiotic-rich kombucha, sourdough, kimchi, sauerkraut and jars of mixed pickles. More importantly, our flock of chickens gets plenty of probiotics, because I ferment their feed, as well. Fermenting chicken feed might sound a bit strange to some folks. But this is one chicken health strategy that reaps far more benefits than the time and work involved to make it happen.

FERMENTATION EXPLAINED

Humans have been using fermentation to preserve foods for thousands of years. Evidence suggests Neolithic people practiced fermentation by making cheese more than 7,500 years ago.

Fermentation occurs when natural yeasts and cultures in the air are encouraged to grow and interact with a food source (in this case, chicken feed) under specific conditions. During fermentation, beneficial microorganisms such as the *Lactobacillus bulgaricus* bacteria break down sugars and starches and turn them into lactic acid. This promotes the development of healthy probiotics, changes the taste of the food, lowers the pH and aids in preservation by killing off harmful microorganisms. It also changes the food's nutritional profile for the better.

BENEFITS OF FERMENTED FEED

You can encourage these good bacteria to grow by soaking chicken feed in water for several days. But you've got roughly three dozen other chores to do. Why on earth would you want to take the time to do this? There are several good reasons why fermentation is worth the few extra minutes it will add to your chore list.

BETTER NUTRIENT ABSORPTION: When you soak grains, you soften them up and make it much easier for the chicken's body to digest all the available nutrients. That's common sense, right? But, if we peek under the surface we see there's more to the story.

All grains, beans, seeds and legumes contain phytic acid, which impairs the absorption of some nutrients. In "Reduction of phytic acid and enhancement of bioavailable micronutrients in food grains" (Gupta RK et. al, *Journal of Food Science and Technology, 2015*), researchers called phytic acid a "food inhibitor" because it limits the bioavailability of nutrients.

Humans have been using fermentation to preserve foods for thousands of years. Evidence suggests Neolithic people practiced fermentation by making cheese more than 7,500 years ago.

If we remove the phytic acid in foods, we're free to absorb all the wonderful nutrients found in whole grains and seeds. And, the fermentation process removes phytic acid. This means when your chickens eat fermented feed, their bodies can utilize the full range of protein, vitamins and minerals that chickens on dry feed can't.

Moreover, the fermentation process actually enhances the nutrition of the feed. It adds B vitamins that weren't in the feed before.

STRONGER IMMUNE SYSTEM: In "Fermented feed for laying hens: Effects on egg production, egg quality, plumage condition and composition and activity of the intestinal microflora" (Engberg et. al, *British Poultry Science*, 2009), researchers found that hens on fermented feed had a stronger immune system than the control group. The fermented feed increased acidification in the upper digestive tract, which helped form a natural barrier against acid-sensitive pathogens like E. coli, salmonella and campylobacter.

The process of fermentation also produces lactic acid, which helps promote the growth of healthy microbes called probiotics. A robust immune system can help your chickens fend off a variety of illnesses and diseases.

LESS WASTE IN THE COOP: Chickens that eat fermented feed produce less waste than chickens on dry feed. And, the waste is drier than birds on a regular feed diet. For you, this could mean fewer coop cleanings throughout the year.

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Fermentation is the same technique used to make wine, beer and sauerkraut. You can ferment chicken feed the same way your local brewery creates your favorite brew and give your flock an impressively long list of health benefits in the meantime.

HIGHER OUTPUT & BETTER QUALITY EGGS: Fermenting feed for your flock may also result in better quality eggs and improved health outcomes longterm.

That aforementioned study in *British Poultry Science* found that hens on fermented feed had heavier eggs with thicker shells. While this makes for a better breakfast, it also reduces losses from laying soft-shelled eggs.

Additionally, "The Foothills Farm Fermented Feed Study" in 2019 conducted by Western Sustainable Agriculture Research and Education found that hens on a fermented feed diet laid 9% more eggs than hens on a regular feed diet.

HOW TO FERMENT YOUR CHICKEN FEED

Fermenting chicken feed is simple, and it will only take a few minutes out of your day.

MATERIALS NEEDED

- large mason jar or bucket
- mix of crumble, pellets, scratch, or whole grains and seeds like rye, quinoa, whole oats, sunflower seeds, barley, spelt, buckwheat, amaranth or sorghum.
- dechlorinated water
- cheesecloth or other loose covering for jar or bucket

STEP 1: MEASURE

Your first step is to figure out how much your flock eats daily. Most full-sized adult birds eat around ½ cup of dry feed per day. For example, a flock of 10 chickens will eat around 5 cups of dry feed per day. You'll cut this in half when calculating how much feed to ferment for your flock.

Measure out ¼ cup of feed or grain mixture per bird, and place the seed in the jar or bucket you're using. Using our example, if you have 10 chickens, you'll need 2½ cups of dry feed or grains to ferment.

Only measure out enough grain to feed your chickens for one or two days. Fermented feed spoils quickly once it's taken out of the soaking water.

Keep in mind that you can choose a variety of grains to ferment, or you can ferment just one grain at a time. You can also ferment crumble or pellet feed; however, it will get quite mushy after a 3-day ferment. Your chickens will still love it, though!

STEP 2: ADD WATER & SOAK

Fill the jar or bucket with enough water to completely cover the feed, along with a few extra inches so the feed has room in the water to expand. You don't want to add too much water, though. While this won't hurt the fermentation process, too much water can make it harder to spot the bubbles that show healthy fermentation is taking place.

If you have chlorinated tap water let it sit out, uncovered, for 24 hours so the chlorine can evaporate. Chlorinated water can inhibit the growth of beneficial bacteria, so you don't want to use it. You can also use filtered or distilled water.

STEP 3: COVER & LET FERMENT

Cover the jar or bucket with the loose cover of cheesecloth, or the loose-fitting lid. The cover helps prevent unwanted bacteria or mold spores from getting into the ferment yet allows the fermentation gasses to escape.

Store the fermentation at room temperature, out of direct sunlight, and away from cold drafts. The optimal temperature range for fermentation is 75 to 85 degrees Fahrenheit. So if your house is cool, keep the ferment in the warmest room.

Let the ferment sit for three days, stirring from the bottom up at least three times per day. If the feed soaks up too much water, add enough back in so that the grains stay covered by at least one inch. Make sure the grain mixture is always submerged in water.

By the second day, you should start to see tiny bubbles in the jar. This is good news! It's a sign that active fermentation is occurring. The ferment should smell tangy and clean, like sourdough bread or yogurt. The liquid will also start to get a bit milky looking.

BONGIOZZO/STOCK.ADOBE.COM

Feed and treat your hens properly, and they'll supply you with tastier and more nutritious eggs.

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Only measure out enough grain to feed your chickens for one or two days. Here is day 1 of the fermentation process (right).

By the second day (far right), tiny bubbles should appear in the jar.

On the third day (right), you can feed the fermented grains to your flock and refrigerate any unused feed for the following day.

STEP 4: DRAIN & FEED

On the third day (72 hours after starting your ferment), pour off the excess water. If you're about to start a new batch of ferment, however, save the water and use it to cover the fresh grains. It will speed up the fermentation of the next batch.

Feed the fermented grains to your flock immediately and refrigerate any unused feed for the next day.

TROUBLESHOOTING

Although it's easy to get started with fermentation, things don't always go as planned. Sometimes, due to temperature fluctuations or bacterial contamination, your ferment will fail and be unsuitable to feed to your chickens.

SNIFF CHECK DAILY: Healthy ferments should smell tangy and clean, like sourdough bread or plain yogurt. If the ferment starts to smell sulfurous, like rotten eggs, or acidic, like vomit, throw it out. An off odor is a sign that your ferment was exposed to too much oxygen, too much heat, or bacteria was introduced during the beginning of the ferment.

CHECK FOR MOLD: You also need to check for mold daily. Any signs of pink, black or fuzzy mold on the surface means the entire batch needs to be thrown out.

If your ferment develops mold, it could be because the temperature was too cold (which slows the bacteria and prevents the fermentation from happening fast enough to stop mold from developing,) there was not enough liquid in the jar or bucket, or the brewing container was contaminated.

Heather Levin is a homesteader, chicken wrangler of 30-plus chickens, and the founder of The Greenest Acre and Chicken Health Academy, a pioneering online learning academy that teaches natural and emergency chicken care strategies. Get weekly chicken care tips via her website, www.thegreenestacre.com.

While most commercial chicken feed is nutritionally balanced, your birds will certainly benefit from a little fermentation.

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Scratch shouldn't make up more than about 10% of your birds' total daily food consumption.

HANNASTUDIO/ISTOCK.COM/GETTY

SCRATCH THIS!

Supplementing your chickens with a little scratch throughout the year can be beneficial to their health and state of mind.

BY DEB BRANDT

Standing at the "snack bar" in a local urban feed-supply store looking at an assortment of specialty grains might leave you scratching your head. Which are best for your hens? How much should you offer to your flock on any given day? And what mixture is nutritionally sound?

Chickens scratch the ground every day searching for seeds, insects and other tasty treats. Offering them scratch grains, such as cracked, rolled or whole grains (corn, barley, oats or wheat), stimulates that behavior while providing them with added food resources. Scratches are a source of mental and physical stimulation — particularly during the winter months when weather conditions reduce the presence of natural treats such as insects, grass and seeds. Understanding the content of scratch mixes can help you determine what to choose from the buffet at your local feed-supply store.

JACKF /STOCK.ADOBE.COM

The main ingredients in chicken scratch are usually whole grains (cracked corn, wheat and barley) with secondary ingredients such as sunflower seeds, dried mealworms, flaxseeds and even dried fruit such as cranberries and raisins.

A word of caution: Scratch grains are not meant to be the primary source of nutrition for your flock. Think of scratch as a limited treat — something hens enjoy but should not consume in large quantities. Feed mixes are nutritionally balanced resources your hens need for healthy living. They contain nutritional elements including calcium and protein that support growth and egg production. Chickens need those resources much more than tasty scratch offerings that they will inevitably enthusiastically eat.

DIET MATTERS

According to Laura Harper, owner of The Urban Chicken store in Raleigh, North Carolina, the average hen eats about a ¼ pound of food a day. Scratch should make up only about 10% of that. Any more than that will affect their nutrient balance.

"Scratch is so low in protein that it doesn't support hen health," Harper says.

As with humans, too much of a good thing isn't necessarily a good thing.

Robert Litt, former owner of the Urban Farm Store in Portland, Oregon, says chickens eat for energy, and if you provide cracked corn with unfettered access alongside layer feed, they will eat all their calories in corn. And corn offers only 7% protein while prepared chicken feeds offer 16% protein with corn in the mix.

Chickens that are consuming too much scratch can experience extended molts because of the low amount of necessary protein. A lack of nutritional balance can also affect egg production and cause birds to become unhealthily overweight. When hens choose between their regular feed and scratch, the feed lingers untouched in feeders, attracting mice and rats to your run.

With nutritional needs in mind, Litt and Harper educate people about the use and offering of scratches. Scratches should not be the only source of food a small flock receives. Scratches are always treats, and understanding their content can improve the health of your birds.

Scratch Advice

Here is what Jacquie Jacob, poultry extension project manager at the University of Kentucky, says about chicken scratch, in "Feeding Chickens for Egg Production."

"Scratch grains are like drench fries; chickens that eat too many scratch grains have less of an appetite for more nutritious feed. If you are using scratch grains, feed them to chickens in the afternoon after birds have eaten complete feed, and then provide only as much scratch grains as chickens can finish in 15 to 20 minutes."

KALYPSO /STOCK.ADOBE.COM

COLD-SEASON SCRATCH

During winter months, cracked corn is a good addition to any scratch recipe. Cracked corn is a high-energy carbohydrate made of starch and sugars. Chickens love it. Fed before dusk on cold days, the corn provides a thermic effect creating heat as it's digested. This helps hens stay warm on long winter nights.

Scratches can also help bored hens during the wintertime. Cold months often limit hen activity levels, keeping them inside the coop and more sedentary than during other seasons. During these times, flocks become more disruptive, pecking at one another when boredom sets in. Scratch provides mental and physical stimulation for a small flock.

"During the winter, I suggest that people offer scratch in the form of a flock block or in a toy that makes the girls work harder for the food," Harper says.

Toys that require the hens to work harder to obtain the treats promote activity, fight boredom and keep hens busy. Rather than picking on one another, hens will puzzle out how to get their favorite treats.

SUMMER SCRATCH

During the hot days of summer, eliminate corn from scratch. Because corn stimulates metabolism, it can cause heat-related stress for birds. The summer is a time to add alternatives that provide nutrition, such as calcium and protein.

"Summer scratch can contain whole oats to help with heat stress," Harper says.

It, along with dried soldier fly larva, which adds calcium, is an excellent resource during the peak egg production days of summer. Harper sees people mixing their own summer scratch blends by including flax seed and

NORRIE39/STOCK.ADOBE.COM

Scratch in winter can provide some entertainment for your cooped-up birds, while summer might be better served with garden leftovers.

RETBOOL /STOCK.ADOBE.COM

MICHAEL FRITZEN /STOCK.ADOBE.COM

It's not necessary to feed scratch grains to chickens that receive a complete diet. However, scratch is a great treat and can provide added energy in winter (right).

Throw some scratch in a compost pile (far right), and let the chickens mix it up while looking for snacks.

raisins along with the whole oats. Hens that have some free-range time in a backyard each day gain the benefits of nature's own scratch: new grass, insects, seeds, weeds and more. These fresh local foods are great for flock health because hens must work hard to find them.

MIX & MATCH

Litt and Harper offer their own special blends of premixed, seasonally sensitive scratches. Each shop owner also provides scratch bars with resources for customers to make their own blends.

Harper suggests a wide range of ingredients when blending your own. She uses mealworms, dried soldier fly larva, oats, barley, wheat, flax seed — which is high in omega-3 for egg laying — sunflower seeds, raisins, kelp and a vitamin/mineral supplement. Harper also suggests making grit available on a free-feed basis.

SCRATCH CAUTIONS

Chickens can — like humans — become addicted to their favorite scratch food items. Litt says that these hens become pushy, grumpy and demanding, expecting and

choosing available scratch over the feed they need for a balanced diet.

Employ a tough-love approach; give hens limited access to scratches, with their health and well-being in mind. Too much scratch can cause health problems including weight gain, longer molts and summer doldrums in egg production.

Litt and his wife, Hannah, work to find natural resources for hens that promote better health and egg production. The pair co-authored *A Chicken in Every Yard* (2011) and have researched the use of natural options for feed and scratches. For instance, Hannah Litt discovered that black cumin (*nigella sativa*) seeds could support egg production and size.

The Litts offer it in a mash so that none of the tiny black seeds are wasted. Their interest includes energy for hens. For instance, amaranth is another scratch ingredient that can add protein energy.

Robert Litt noted that people often offer hens kitchen scraps, such as pastas and bread. These too have low nutritional value because they don't contain much protein. Small meat scraps are a good protein option.

Some people have begun growing their own scratch. This includes raising fodder by sprouting seeds that are fresh and inviting. Litt suggests a windowsill fodder system.

Chickens also like silage, fermented greens left from the summer season. Silage offers helpful probiotics that are partially digested and enable chicken keepers to offer greens throughout the winter.

Overall, scratches offer benefits in moderation; just like us, hens need care and attention when it comes to choosing a diet. Seasonal offerings can help your hens have successful molts in the fall and winter and begin the spring and summer season with good egg production. Experiment with creating your own scratches by observing what your hens do and don't prefer.

Deb Brandt grew up on a hobby farm with dogs, horses, goats and a rooster named Clarence. Today, she lives in Indianapolis, Indiana.

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BROODER CHECKLIST

Whenever you order your chicks — be it late fall or early spring — make sure your brooder is ready to go when they arrive home.

BY CHICKENS MAGAZINE EDITORS

Woohoo! New chicks are in the mail or you're about to make a run to the farm-supply store to pick some up. Either way, make sure to set up your brooder about 48 hours before they arrive. This will allow time for bedding and equipment to dry and the temperature to set. Also, check the following off your list.

- ☐ Check for drafts.
- ☐ Ensure proper ventilation.
- ☐ Repair or replace loose or broken windows.
- ☐ Check for damaged flooring or walls.
- ☐ Check for damaged nesting boxes or roosts.
- ☐ Put down fresh, clean litter.
- ☐ Clean and repair feeders and waterers. (Check metal waterers for rust.)
- ☐ Check any lighting or other electrical items in the coop.
- ☐ If coop is heated, check your heaters.
- ☐ Examine the run for holes or damage that could let predators in.
- ☐ Consider wrapping the run in a tarp.
- ☐ Check for debris or sharp objects inside and outside.
- ☐ Provide a small roost for your chicks for the first week or two.

FOTOPROFF/STOCK.ADOBE.COM

Mandarin ducks line up in a row.

COURTESY WHITE HOUSE ON THE HILL

Exotic PRODUCTS

Raise birds of another feather on the farm for a few extra clucks.

BY JESSICA JAINCHILL

When it comes to the list of homestead animals to raise, exotic birds usually aren't at the top. In fact, for many homesteaders, exotic birds may not even be on the list. As far as usefulness goes, these bird breeds give more in good looks than meat or eggs.

However, Jake, a Missouri homesteader who runs an exotic bird menagerie and the YouTube channel "White House on the Hill," has found that colorful birds such as Mandarin Ducks or White Peacocks actually have real profitability that you might want to start considering.

Though Jake now lives and homesteads on his own land, he originally started his homesteading career on a rental farm in Missouri. As a farm renter, he realized he had the chance to raise chickens, so he and his family started with a dozen chicks — 10 of which turned out to be roosters. Though the batch of chicks didn't pan out as he'd hoped, these chicks were the first step in Jake's homesteading career.

Soon he became aware of other homesteading families who had expanded their homesteading efforts into self-sustainability. "When we started to look up how to take care of chickens, it just kind of opened our eyes to a whole other world," he says. "There's growing your own food and raising your family out in the country where you're doing it all together."

Working with his landlords, Jake expanded his homestead into gardening, but since he was on a rental property, he had to keep his main focus on birds. Unabashed, he turned an old shed into a chicken coop, built mobile chicken tractors to house his growing chicken flock and started hatching his own birds.

"That's where we got into some other types of exotic birds," he says. "We got some Red Golden Pheasants and Mandarin Ducks and peacocks."

Once he mastered hatching birds, Jake was ready to set off and explore the vast world of exotic birds, ranging from White Peacocks and emus to midnight black Ayam Cemani chickens. And much to his benefit, the exotic bird world held a promising niche market.

PHOTOS COURTESY WHITE HOUSE ON THE HILL

The White House on the Hill family lives on a 40-acre farm that they're building from scratch with chickens and other exotic fowl.

THE EXOTIC BIRD MARKET

An exotic bird may not top everyone's Christmas list, but Jake has found the market surprisingly vigorous. "There's a good market for a lot of the birds," he says. "Emus can get pretty expensive the more mature they get. An egg can be about $50, and a hatched emu chick can be a $150 and then a 6-month-old can be $300." Jake's rainbow-sheened Mandarin Ducks also do well on the market, and their sales offset many expenses on his homestead, making it easier for him to expand or start other homesteading projects.

However, though the exotic bird industry is a promising and growing industry, you need to be aware that the market has scammers lurking in it. Facebook is one of the places Jake recommends beginners look for exotic bird breeds, but he warns that exotic bird scammers also consider this platform prime hunting grounds.

"You have to be kind of cautious when you're on Facebook," he says, "because there are a lot of foreign scammers who are scamming people in the U.S. who will pay $200 for a bird. You might try to buy ducks, pay $200 and you never get the ducks." Jake advises that people buy their exotic birds locally off of Facebook, or preferably, meet up with or have someone vouch for the seller.

Still scammers online aren't exactly a new phenomenon, and it shouldn't be too difficult for homesteaders to pick up the difference and do well in the exotic bird market. Jake has already noticed more exotic bird breeders entering the market, causing the market to blossom with demand. This demand is leading breeders to import and breed more rare fowl, like Jake's White Peacocks, Red Golden Pheasants and the vast array of other rare birds he raises.

Jake has also noted that postal deliveries have made raising and selling exotic birds much simpler and even provide guarantees for the safety of shipped livestock. The exotic bird market demand and new delivery conveniences make it less of a risk for homesteaders to try exotic birds as an investment, at least enough to get their feet a bit wet before taking the full plunge into raising exotic birds.

HOUSING & FEEDING

For those ready and set to bring exotic birds onto the homestead, the first step is constructing an enclosure. Jake houses his birds in stress-free chicken tractors or 6-by-11-foot coops that are 5½ feet high. Concerning how

Peafowl (peachick far left; adult male left) represent the more well-known birds found on the exotic bird market.

many birds you can keep in an enclosure like this, he keeps two peafowl in one, six pheasants in another and six ducks in another.

"I also recommend a hallway pen (15-by-15 feet) situation or larger for several birds to breed together," he says. "For 10-plus birds together, I would go a little larger and build a run and shelter that would be at least 30-by-30-feet with a netted top to give them space to roam, space to get out of the elements and protection from predators."

And as with any living animal you raise, you'll have to consider feed for your birds. The feed Jake likes to use includes layer pellets and game-bird feed which is a combination of corn, milo, whole oat groats, sunflower seeds, Canadian peas, maple peas and oyster shells. However, he does occasionally use pigeon or chicken feed, and in order to add some natural feed to his birds' diets, he uses movable fencing and chicken coops to rotate his birds on pasture.

TRICKS OF THE TRADE

You may have already discovered the hazards of jumping into a new project with blinders on. Somehow that picture in your mind's eye just doesn't pan out like it should have. Raising exotic birds is no different than any other home-based project, which is why Jake emphasizes: Have. A. Plan.

Exotic birds aren't like the regular barnyard chickens and often have different needs that should be well-researched before they are brought onto a homestead. For instance, while chickens might be happy behind chicken wire, a 6-foot emu will kick right through such flimsy fencing. Jake recommends doing plenty of research to ensure the proper enclosure for an exotic bird.

Jake's son, Eli, with emus, Bamboo and Cashew.

Exotic bird eggs (above) can be sold online.

Since covid-19, post offices have made shipping adult and juvenile exotic birds such as mandarin ducks (far right) easier for the exotic bird seller (right).

PHOTOS COURTESY WHITE HOUSE ON THE HILL

When he started keeping Red Golden Pheasants, a breed known for flightiness, one of his male pheasants taught him that researching an exotic bird's needs, like an enclosure, can save a lot of effort later. The bird lived in a structure not built for flighty birds and could easily fly out when someone was entering the coop's door — which it did.

"We chased him around the property, and he could have very easily flown away," Jake says. Thankfully, Jake and his family were able to get the bird back where he belonged but not everyone can be so fortunate. In the long run, well-researching an exotic bird's needs will keep both the bird and you happy.

The big step, and maybe the most exciting, is the exotic bird's big arrival on the homestead. At this point, Jake always considers what sort of container his birds will arrive in and how he can safely and securely move them to a quarantined area before adding them to his main flock.

Though many birds come in boxes or are delivered to doorsteps, some birds, such as Jake's emus, arrive in big trailers and have to be carefully transported to well-prepared pens. Also, since bird diseases aren't anyone's cup of tea, Jake aways makes plans to ensure that new birds don't accidentally contaminate his other birds while they are on their way to their quarantine pens.

So far he hasn't had any problems, but when it comes to expensive birds, he doesn't want to take any chances and always prepares when new arrivals come to his homestead. "There's always that first time that wipes out other birds, and that's why we spend a few days observing them just to be sure," he says.

Like most livestock introduced on a homestead for the first time, the preparation for raising exotic birds is the expensive part, so you'll need some sort of plan to make back the money you put into the project; otherwise, you're going to end up with a very pretty, but expensive and time-consuming, pet. Jake recommended that, in order to make back the finances put into raising exotic birds,

JAY/STOCK.ADOBE.COM

Guineas can be difficult to raise: They're very fast, can soar great distances and go wherever the heck they want.

you should make a business plan for selling chicks, adult birds or eggs.

"When you're on a homestead, everything costs money," he says. "You're growing your own food and raising your own animals. Wherever you can offset expenses or make money is a good thing."

Of course, as with other livestock, homesteaders interested in exotic birds must keep in mind that predators can still be a problem. Jake must contend with the usual suspects: owls, foxes, hawks, raccoons, etc. Fortunately, trial and error have helped him deal with his predator issues.

"Most of our birds are kept in coops and closed up," he says. "We put fencing in the ground and electric outside the fence so a raccoon can't climb up the fence. We're trying to make it as protected as possible. Normally, we use chicken tractors, and those are cheap."

WHY SHOULD I DO THIS?

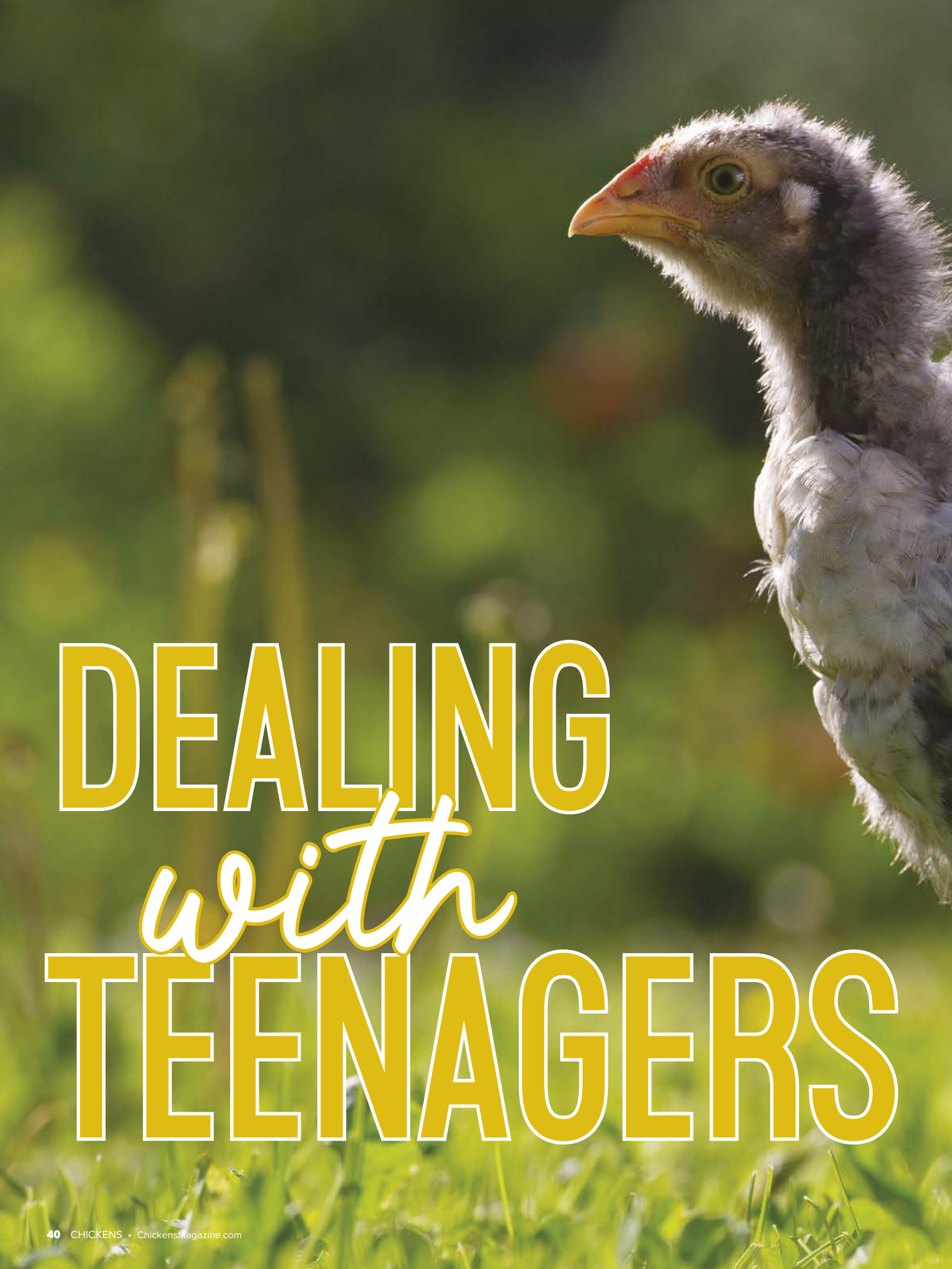
Naturally, you may wonder why you would raise exotic birds in the first place? Homesteaders are supposed to raise things that give back in some way, right? And Jake would 100% agree.

"While exotic birds can't provide food for us, we can sell them to make money and offset feed costs," he says. "Having something to provide a product of value is a good thing on your homestead."

Jake added that homesteading, in addition to creating income and food for the family, should be enjoyable. Though Jake always seeks to make back his money, he picks many of the breeds he raises just because they strike him as interesting or beautiful. And he enjoys his fowls' beauty each day as he and his family work to care for the birds that help supplement their income.

"We want to have beauty everywhere we look, so we really enjoy having birds that are both fun and for profit," Jake says.

Jessica Jainchill is a freelance writer and editor from Missouri. She and her family live on a 1-acre farm and enjoy planting gardens and raising small livestock.



DEALING *with* TEENAGERS

Chickens start acting like human teenagers at about 8 weeks.

ARTICLE & PHOTOS BY BRUCE INGRAM

VIDADY/STOCK.ADOBE.COM

Do you remember how adorable those cute chicks were when they first hatched, seemingly just a few days ago? Do you recall how dependent those little puffballs were on their mother hen, and how they ran to her every time she gave the food cluck?

Now, some eight weeks later, these once fetching little creatures are gangly little cockerels and pullets with scruffy feathers and big feet (especially the males). Worst of all, they often flaunt a little bit of an attitude — constantly bopping each other with their wings or using their tiny beaks as weapons.

Welcome to the world of teenage chickens, that in-between stage when our chooks are no longer chicks but they certainly aren't full-fledged (pun intended) roosters and hens, either. This time period is also when the mother hen and her offspring basically seem to mutually agree that the time of mama shepherding them through their day is kaput. Tom Watkins, president of McMurray Hatchery, gives insight on this trying time for chicken raisers.

"Basically around 6 to 8 weeks after hatching, the mother hen senses it's time to stop protecting her chicks," he says. "If the mother and her young are in a run with other hens and their young flocks, the hen may not even know or care which chicks were once hers.

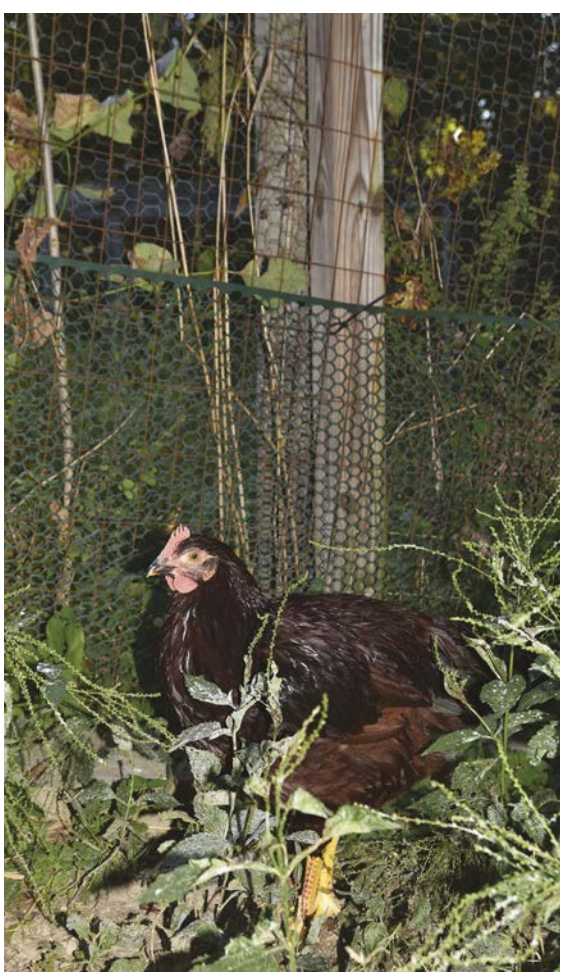
"On the other hand, the former chicks are no longer looking for their mother to provide protection or food. Besides, the mother is likely no longer giving the food cluck to her young. If she's found some kind of bug, for example, she's likely eating it herself."

CHARLOTTE'S LOT

Ironically, when I was assigned this story, my heritage Rhode Island Red hen, Charlotte, had recently stopped caring for her five chicks, which consist of four females and one male. Three-year-old Charlotte had nurtured her flock for 10 weeks, which is the longest she has ever done so during the three summers she has gone broody. I attribute the longer mothering period to the fact that I gave her a chick, named Lucky, which had hatched inside

These 2-month-old Rhode Island Reds have entered the "teenage" stage.

The cockerel (left) and the pullet (right) are both showing clear signs of their sexes. The cockerel's wattles and comb are clearly more pronounced.



The author's heritage Rhode Island Red cockerel, Tom (pictured), was regarded as a keeper at 13 weeks.

an incubator. The other chicks were 10 days older than Lucky, who had become exceptionally dependent on Charlotte because of the former's small size and having older, larger chicks nearby.

Interestingly, during weeks eight through 10 of the "mothering period," Tom, Charlotte's sole cockerel, was extremely combative toward her and the rest of the flock. One morning when I opened the henhouse door, Tom rushed out, chest bumped his fellow flock mates, then headed for Charlotte and pulled the same maneuver on her.

She suffered the initial blow but retaliated with four hard pecks to his head and torso, which sent Tom squalling to the remote regions of the run. The next three mornings, it was Charlotte that initiated the assaults, using her beak to hammer her teenage male into submission. At this writing, Tom has never challenged his mother again. I asked Watkins about this behavior.

"After the mother hen is through raising her chicks, she is still going to want to be on top of the pecking order; it's instinctive," he says. "But I also believe the cockerel's behavior you described had little to do with his sex nor is it a breed-specific behavior. The behavior had little to do with an individual chicken's personality, either.

"Although the drive to become the alpha is more likely to come from a young rooster, I would also add that if the cockerel hadn't

It's time to cull some cockerels at 2 months of age (if not before).

At 24 weeks of age, this pullet (right) is laying her second egg while her flock-mate waits her turn to do the same.

When a teenage chook has a chance to escape its tormenting flock members, skirmishes are less likely as each pullet and cockerel is off doing its proverbial own thing. Indeed, at this contentious stage of chicken development, letting your birds range about for a few hours every day is one of the best ways to defuse issues among flock members.

challenged the mother hen, sooner or later one of the pullets would have. Again, it's instinctive in a chicken to be the dominant one."

KIDS WANT FREEDOM

Watkins relates that conflicts among teenage chickens become fewer if our birds can be put out to pasture. When a teenage chook has a chance to escape its tormenting flock members, skirmishes are less likely as each pullet and cockerel is off doing its proverbial own thing. Indeed, at this contentious stage of chicken development, letting your birds range about for a few hours every day is one of the best ways to defuse issues among flock members.

"I don't care whether you have six birds or 200, letting your chickens free-range for at least a short time every day is good for them and heads off problems that result from being cooped up," Watkins says. "Being outside on pasture also helps chicks and teenagers develop earlier. The birds seem to feather-out sooner, as well, and their foraging skills develop quicker. I believe that chicks raised under a heat lamp are the slowest ones to develop. Being outside and on pasture helps chickens develop in a survival of the fittest-type way.

"Being outside also helps develop your chicken's curiosity. There is so more to do outside: searching for bugs and seeds, for example. I also think being outside at a younger age enables birds to leave their mother hen earlier in their lives. But that's just an opinion."

CHANGES

Certainly two of the more interesting aspects during the time when a chick transitions into the teenage period is the development of sex-related anatomy and the change in behavior.

"People send pictures all the time to McMurray Hatchery wanting us to identify whether a chick is a male or female," Watkins says. "Some people claim that they can sex chicks when they're 2 weeks old, but I'm much more confident about predicting their sex when the chicks are about 6 weeks of age. The waddles and combs of the cockerels are well developed by that age.

"But, on the other hand, some roosters and hens are much slower to develop, and it's very easy to make a mistake when that is the case. A lot of people will get fooled when they see the first little stub of a comb appear, and they think that has to belong to a rooster. But that little comb could turn out to belong to a fast-developing hen."

I agree with Watkins' assessment. For example, last spring my wife, Elaine, and I had two different sets of chicks, six in one flock and five in the other. At week four for the former congregation, I told Elaine that the ratio was four females to two males, whereas in another two weeks, it was clear that we possessed equal numbers of pullets and cockerels. At week four for the second gang, I guessed the tally was three males and two females. A fortnight later, Elaine and I were clearly the caretakers of four pullets and one cockerel. In short, by the time the mother hen is finished taking care of her offspring, chicken raisers should be able to easily identify their genders. Before that period, guesses are only guesses.

During the teenage period, both sexes' growth rates continue to be quite rapid. By week 16, the general advice is that we should stop giving our young flocks chick feed and replace it with layer rations. Elaine feels that our flocks of this age do better with a mixture of the two until the chick feed, which is such a high-protein diet, disappears. This time period also brings forth another behavior.

"At 16 weeks, cockerels can become more sexually aggressive toward the hens and more combative with each other as their hormones rise," Watkins says. "A lot of young roosters like to fight with each other."

By weeks 20 to 22, if not before, breeding attempts will be common among teenage males. The cockerels will frequently try to mount the hens and pullets. From my

Two pullet eggs, laid when the young hens were 24 weeks old, flank the egg of a mature hen.

observations, older hens will often respond with aggressive moves, especially pecking, toward the unwanted advances while pullets will attempt to escape a cockerel's advances. If a cockerel does succeed in cornering a pullet, his initial mounting attempts at this time often fail because the male loses his balance. Eventually, of course, the cockerels display competence in this area.

Another of the most fascinating aspects of this time period is a cockerel trying to crow for the first time. The poor creature can't seem to progress much beyond the first syllable of the "cock-a-doodle-do," and even that opening volley of future rooster-hood being announced is more comical than majestic.

But gradually over the next four weeks or so, the budding roos do become more adept at crowing. And the feistiness between all these hormonal males can become even more intense. It's at this time that chicken raisers, if they haven't already, should strongly consider culling their cockerels or try to find a new home for them.

Watkins says one cockerel for every eight to 10 hens is sufficient, and there is really no biological reason to keep more.

HARVESTING

Elaine and I don't wait until week 16 to begin culling. At week seven (when we are absolutely sure of every bird's sex), we position different colored leg bands on every cockerel so that we can begin to recognize different behavior characteristics in each young male. For example, in our flock that featured three each of cockerels and pullets, one of the former tried to bite me every time I picked him up. He was the first to be culled, in week nine.

His two cockerel flock mates also met a similar fate because of the presence of an outstanding young male in the adjoining run, the aforementioned Tom. He was submissive when I picked him up and, despite his earlier scuffles with his mother, sported a stately, aloof nature and a calm disposition. With our 3-year-old rooster Friday ruling the adjoining run, Tom was the only additional roo we needed.

THE EPIC DAY

The teenage weeks and months eventually end, of course, and the best sign of that is when pullets produce their first eggs. From Elaine's and my experience, that's around weeks 20 to 22 for industrial birds and

Another of the most fascinating aspects of this time period is a cockerel trying to crow for the first time. The poor creature can't seem to progress much beyond the first syllable of the "cock-a-doodle-do," and even that opening volley of future rooster-hood being announced is more comical than majestic. But gradually over the next four weeks or so, the budding roos do become more adept at crowing.

approximately 24 weeks for the heritage Rhode Island Reds we now raise. For example, this past October when Elaine came out at midday to check on our two flocks, she found a tiny, round, brown egg near the waterer in the run where the pullets live.

Again, from our experience, pullets seem to be taken by surprise when that initial egg develops within them. That's why, at this time, we search for random eggs in random places around the run. Nevertheless, by week 25 last October, as is typical, all three of our pullets were laying eggs in the henhouse's nesting box.

Human parents aren't the only creatures that experience trying times with teenagers. The teenage weeks and months can obviously stress us chicken enthusiasts, but when our cockerels give their first full-throated crows and our pullets lay their initial eggs, we forget the previous troubling times.

Bruce Ingram has written more than 2,600 magazine articles and is the author of five books on river fishing and floating, four young-adult fiction novels, a healthy living and recipe book, and an upcoming children's book. For more information, email bruceingramoutdoors@gmail.com or visit his Facebook page at https://bit.ly/3sfbTVM.

Two teenage pullets flank the author's mother hen, Charlotte. At some point, adults and teenagerslose interest in the other and go their own ways.

Poultry Lessons

In early 2021, my family was thinking about getting some pet chickens for eggs. Every weekend, we would go to farm-supply stores for supplies. We even had a custom coop built by a local builder. In April, we got our first Rhode Island Red hens: Phoenix, Joe, Eater, Daisy, Big Bird, Karen, Popcorn, Angela, Suni and Jeffrey. The breeder said they were roughly 2 years old, but we believed they were older.

These hens were the sweetest birds I had ever met. They would hear me coming outside and immediately start "talking." I spent hours hanging out with them, taking care of them in the morning and night and daydreaming about them during school (especially during math!). However, most passed away within a year or two; we currently only have two left: Big Bird (more on her later) and Daisy.

CHICKEN MATH

My brother, Carson, and I kept researching new chicken breeds and really wanted a rooster and some more hens. We found a lady selling two Black Australorp hens, one Rhode Island Red hen, one Easter Egger hen and an Easter Egger rooster because she was moving and didn't want to transport them.

By that fall, it was time for more chickens! I purchased some chicks at a farm-supply store with my own money: two Speckled Sussex, which is one of my favorite breeds; four Sapphire Gems; and two brown Easter Eggers. The chicks lived in the back of our horse trailer with a heat lamp in a plastic pool lined with bedding.

Malia and Chika wait to show at the 2022 county fair.

Every time I buy chickens, I get more creative with breeds. This round of birds was one of the sweetest but sassiest. This was my first time with chicks, and I really discovered my love for these tiny little creatures. I just loved checking on them, hanging out with them and hearing their little peeps.

SUBSTITUTE TEACHERS

Ever since 2018, Carson and I have been involved in 4-H, and we're just starting to show chickens. One of our club leaders asked us if we would like to add a few baby chicks to their order. I excitedly started researching the best

Tell Us *Your* Story!

Email the story of your chickens in ~750 words to chickens@chickensmagazine.com (subject line: Chicken Chat). Be sure to include high-resolution images of yourself, your chickens and/or your coop. The author of each issue's published essay will receive five bags of naturally-grown hemp bedding from **Eaton Pet & Pasture (646-759-9247; www.eatonhemp.com)**, which will be your new favorite find for brooders and nesting boxes! It's virtually dust-free, soft and cozy, super absorbent and odor-eliminating, making it the perfect replacement to shavings.

NO PURCHASE NECESSARY TO ENTER. Contest is open to legal residents of the 50 United States or District of Columbia, age 21 or older. Entries must be received between 12:00:01 a.m. PT on 04/25/2023 and 11:59:59 p.m. PT on 06/25/2023. See Official Rules on page 64. Void where prohibited by law. Sponsor: EG Media Investments LLC

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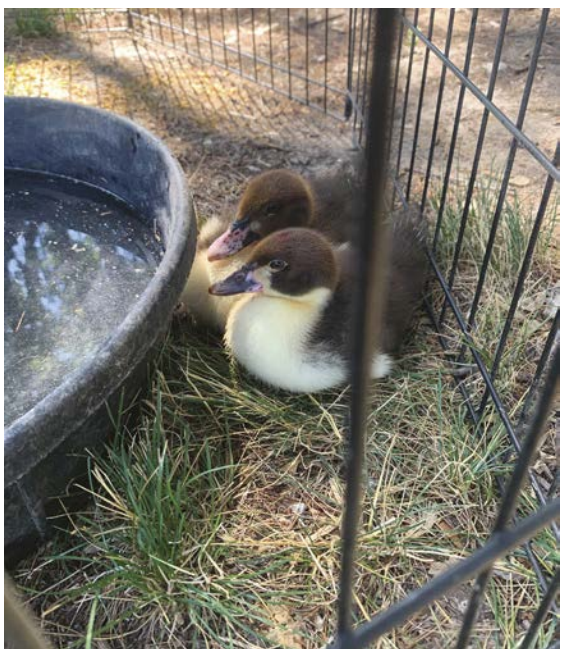

breeds to show and decided on a Golden Laced Wyandotte. (To anybody who wants sweet birds to start your flock, choose these! They're the nicest birds and my favorites!) and a Plymouth Rock. Carson chose a White Leghorn and a Buff Orpington. (These two breeds are also super sweet, and I totally recommend them as well!)

Well, the hatchery messed up the order and didn't send a Plymouth Rock but instead sent two Black Stars. Although I was sad and disappointed, I am now thankful that they messed up the order because my two Black Stars are such outgoing birds. Every time I walk into the coop, they run up and greet me.

In early August, Carson and I took our birds to the fair. I showed my Golden Laced Wyandotte, Greta, in the showmanship class and the pullet class. She behaved very well and placed third. I also showed my Speckled Sussex hen, Chika, placing fourth.

My birds stayed the week at the fair. They loved the extra attention, but by the end, they were ready to get back home and see their friends.

ADDING DUCKS

In early June, we decided to add some ducks to our flock and settled for four Muscovies. Muscovy ducks are the closest ducks to a chicken and get along great.

They are very odd because they don't quack; instead, they hiss and growl, and red bumps grow all over their head. They sometimes frighten the chickens. but they just really want to be friends.

SOCIAL STUDIES

One of my original chickens, Big Bird, kept getting bullied. Her coop mates would even rip her feathers out. I knew I would eventually have to do something.

One day when I got home from school, Big Bird was sitting in the nesting box with her head gushing blood and her flesh showing. My mom and I took her into our basement and put her in a cat carrier. I visited her every day and came to realize there was something special about this small, hopeless, old hen.

We soon moved her into our shed into a dog kennel, where she loves spending time. Her head healed perfectly, which I am very thankful for. She also sometimes hangs out with her bestie, Daisy. Big Bird is the first chicken that I really bonded with. I hope she has a smooth future and an easy rest of her life.

I love my chickens more and more every day. This spring, I plan on getting more chicks: a Buff Cochin (this will be my first Cochin and I'm thrilled!), a red laced Blue Wyandotte and a Silver Spangled Hamburg. For any new chicken owners, my advice is to start with older chickens. They are way less maintenance than chicks, they produce eggs right away, and they're extremely sweet.

Malia F. lives in Prescott, Wisconsin. She prefers cold-hardy breeds with sweet dispositions.

Malia and Greta face the judges at the county fair (above left).

Big Bird and Daisy (Rhode Island Reds, above) are best friends.

These are two of Malia's Muscovy ducks, Skipper and Lucy, as babies (left).

CHICKENS & DUCKS

Use a broody chicken to hatch duck eggs.

BY GAIL DAMEROW

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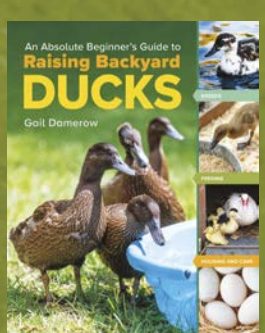
Although duck eggs take a week longer to hatch than chicken eggs, a chicken hen can successfully hatch duck eggs. A chicken can cover about 12 eggs of the same size she produces. To hatch duck eggs that are larger than her own, don't expect her to handle more than about 10. If the duck eggs are smaller than her own (such as those of a bantam duck), she might be able to cover as many as 18.

All the eggs must fit handily beneath her. If any stick out around the edge, chances are she'll eventually rotate them back under her and let some other eggs take a turn getting chilled, until they all fail to hatch. Because duck eggs take longer to hatch than the 21 days required for chicken eggs, use a proven broody hen to hatch them. A hen that's brooding for the first time may not stick around long enough to finish the job.

All the eggs in a nest must hatch at approximately the same time so the ducklings can leave the nest together, under the protection of the mother hen. Therefore, once you are assured that the chicken is indeed broody, remove whatever eggs are in her nest and replace them with the number of duck eggs you wish to hatch.

Chickens typically mother ducklings as if they were their own. Some chickens become upset if their newly hatched babies waddle into water for a swim. Others, however, take it in stride, jumping right in and happily paddling around right along with the ducklings.

Gail Damerow lives on a farm in Tennessee where she and her husband keep poultry and dairy goats, tend a sizable garden, and maintain a small orchard. She has authored more than a dozen books, including Storey's Guide to Raising Chickens*; several* Chickens *magazine articles; and blogs at www.gaildamerow.com.*



Excerpted from *An Absolute Beginner's Guide to Raising Backyard Ducks* © by Gail Damerow. Used with permission from Storey Publishing.

COURTESY TRISTAN PEIRCE

Raising the BAR

Fresh raw eggs add froth and creaminess to cocktails and icy blender drinks.

BY SIGNE LANGFORD

You probably already know this, but there's no reason to shy away from drinking — or eating — your own backyard-fresh eggs raw. They're good, healthy food; when hens are kept right, in a clean environment, with plenty of fresh air, sunshine and grass, the chances of an overgrowth of bad bacteria are slim.

Folks have been adding raw egg — whites, yolks or both — to drinks and foods for centuries. Yolks and whole eggs add an unmistakable rich, silky, creaminess without adding dairy, and adding whites to a cocktail shaker gives drinks a professional foamy top and velvety texture. Seven heavenly *egg*cellent concoctions perfect for summer sipping appear on the following pages. Enjoy!

Tip: When using raw eggs in recipes, always break the egg into a bowl first, before adding it to the rest of the ingredients. That way you can discard any with unappealing blood spots or ones that don't pass the sniff test, without contaminating the other ingredients and ruining the whole recipe.

Disclaimer: Consuming raw or undercooked meats, poultry, seafood, shellfish or eggs may increase your risk of food-borne illness, especially if you have a certain medical condition; are pregnant, elderly, very young; or have a compromised immune system. Before beginning a recipe, it's recommended to do the necessary research and make appropriate food-handling decisions. You assume full responsibility for any food handling and cooking doneness decisions made regarding your own health and safety, and the health and safety of those consuming the recipes.

Signe Langford is a chicken-keeper, a gardener and a chef. She is the author of Happy Hens & Fresh Eggs: Keeping chickens in the kitchen garden, with 100 recipes *(Douglas & McIntyre, 2015).*

Liquid Lemon Meringue

Limoncello is a sweet-tart Italian lemon liqueur that's great to have on hand for making cocktails and baking; it's lovely and refreshing on its own over ice after a meal or simply added to chilled fizzy water. This pretty cocktail delivers the flavor of the classic pie without the baking!

YIELD: 2 drinks

INGREDIENTS

- 1 ounce plain or vanilla vodka
- ¼ cup freshly squeezed lemon juice
- ¼ cup limoncello
- 1 free-range egg white
- lemon peel to garnish (optional)

PREPARATION

Add all ingredients to a cocktail shaker half-filled with ice. Shake well for at least 30 seconds – really develop a thick, meringue-like foam; hold the ice back and pour into two generous martini glasses. Garnish with a bit of lemon peel, if desired.

COURTESY TRISTAN PEIRCE

Cool + Calm

This healthy, rich but refreshing blender mocktail is just what the doctor ordered for any time of day. Brew the green tea the day before and refrigerate, but don't leave the tea leaves — or bags — in the pot, or the brew will become bitter.
YIELD: 2 drinks

INGREDIENTS

- 1 cup brewed and chilled jasmine or plain green tea
- 1 whole free-range egg
- 2 tablespoons maple or agave syrup
- 1 cup whole dairy or chilled plain almond milk
- 4 ice cubes

PREPARATION

Add everything to a blender and blend on high into a smoothie; pour into two glasses. Serve immediately as this drink may separate if left to sit for too long.

To take this from mocktail to cocktail, add ¼ cup of green tea liqueur and eliminate the syrup.

COURTESY TRISTAN PEIRCE

COURTESY TRISTAN PEIRCE

Blueberry Maple Sour

This is so pretty and so delicious! We've used a specialty liqueur from Quebec called Sortilège, but any whiskey or bourbon-based maple liqueur will do.
YIELD: 2 drinks

INGREDIENTS

- ½ cup frozen blueberries
- ¼ cup whiskey or bourbon
- 2 tablespoons freshly squeezed lime juice
- 1 free-range egg white
- ¼ cup Sortilège or other maple liqueur
- 2 to 4 dashes Angostura bitters; depending on how tart you like things
- thin lime slices to garnish

PREPARATION

Into a blender, add frozen blueberries, lime juice and whiskey; blend on high until puréed. Let stand for at least 20 minutes or longer; the berries will infuse flavor and color into the whiskey. Strain through a fine sieve or cheesecloth; discard the blueberry pulp. You should end up with about ⅔ cup of infused blueberry whiskey.

Into a cocktail shaker, add the strained blueberry-whiskey mixture, egg white, maple liqueur, and bitters; shake well for at least 30 seconds. Strain into two tumblers with ice and garnish with a lime slice.

TIP:
When using raw egg white in a cocktail, it's a good idea to pick out the chalazae — that solid white squiggly thing connecting the yolk to the white; it's never fun to find it in your drink!

COURTESY DONNA GRIFFITH

Creamy Vanilla-Orange Nog

Christmas isn't the only time for nog! Made with fresh, raw, whole eggs and cream or milk, nogs are rich, creamy and frothy, and perfect for brunch. Combining vanilla and orange gives this velvety treat its delightful creamsicle flavor. Don't substitute the freshly squeezed OJ for anything less; store-bought is just too acidic.
YIELD: 2 drinks

INGREDIENTS

- 1 small tin mandarin orange slices in syrup; drained, syrup reserved
- 1 cup freshly squeezed orange juice
- ¼ cup vanilla vodka
- 1 whole free-range egg
- 1 tablespoon reserved syrup from tinned mandarin orange slices
- 2 tablespoons 35% or whipping cream
- 8 ice cubes

PREPARATION

Make the garnish in advance (optional): Thread several mandarin slices onto two skewers and set aside in the freezer on a bit of wax paper several hours or the day before. You could also just simply garnish with a couple of orange slices.

Into a blender, add the orange juice, vodka, egg, mandarin syrup and two ice cubes; blend until smooth.

Pour into tumblers with the remaining ice; garnish with frozen mandarin slices.

Mango Flip

Like nogs, flips are silky and frothy and call for fresh, raw, whole eggs. Unlike nogs, they don't call for cream or milk. This rum-spiked smoothie is ultra-thick without being overly rich. Serve in a tall glass with a garnish of frozen mango.
YIELD: 2 drinks

INGREDIENTS

- 1 cup frozen mango chunks, plus extra for garnishing
- ¾ cup mango nectar
- ¼ cup white rum. (Darker rums test fine, but muddy the lovely orange color.)
- 1 whole, free-range egg
- 4 ice cubes

PREPARATION

Into a blender, add the mango, mango nectar, rum, egg and ice cubes; blend on high until smooth.

Pour into 2 glasses and garnish with some skewered fresh or frozen mango chunks.

COURTESY TRISTAN PEIRCE

COURTESY DONNA GRIFFITH

Raspberry-Rose Ginny

The essence of rose is perfect with gin. Add raspberry and you've got an ode to springtime and summer; adding egg white to this elegant cocktail makes it frothy and smooth. Gin runs the gamut of flavor profiles from juniper-forward to herbal to floral and melon. Look for a gin with notes of rose petal, such as Hendrick's from Scotland. Rose syrup is easy to make but can also be found in specialty food shops or online.
YIELD: 2 drinks

INGREDIENTS

- ¼ cup gin
- 2 tablespoons rose syrup
- 1 tablespoon homemade seedless raspberry jelly or excellent quality store-bought
- 1 free-range egg white

PREPARATION

First make the rose syrup. Add ⅓ cup rosewater and 3 tablespoons of vanilla sugar to a small saucepan over medium-high heat and bring up to a simmer. Cook for about 5 minutes, stirring often, until sugar is dissolved. Set aside to cool; transfer to a bottle or jar and refrigerate until ready to start bartending. Do this up to a couple of weeks before and store, covered, in the fridge. It needs to be cold when used in the cocktail.

For the cocktail: Add all ingredients to a cocktail shaker with ice. Shake vigorously and strain into 2 pretty martini or champagne glasses. Garnish with rose petals if you can find some organic ones!

Chocolate-Brandy Cream

If you enjoy that classic 1980s cocktail, the Brandy Alexander, you'll love this chocolaty version. Rich, sweet, creamy and decadent, serve this after dinner instead of dessert. And speaking of dessert, drizzle a splash of this cocktail over dishes of vanilla ice cream for a grownup sundae.
YIELD: 2 to 4 drinks depending on size and type of glass

INGREDIENTS

- ¼ cup brandy
- ¼ cup dark crème de cacao liqueur or coffee liqueur such as Kahlua
- ¼ cup white crème de cacao liqueur
- 1 whole free-range egg
- ¼ cup 18% or table cream
- Pinch of freshly grated nutmeg or cocoa or shaved chocolate to garnish (optional)

PREPARATION

Add all ingredients except the nutmeg/cocoa to a blender with about 4 ice cubes and blend on high until smooth; pour into glasses and garnish with a tiny sprinkle of nutmeg or cocoa or shaved chocolate, if desired.

COURTESY TRISTAN PEIRCE

General Store

Bring the chickens inside with rooster, hen and chic(k) décor.

compiled by Sarah E. Coleman

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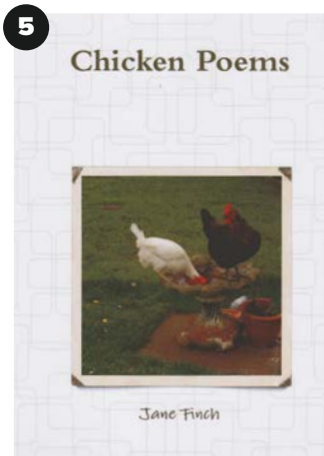

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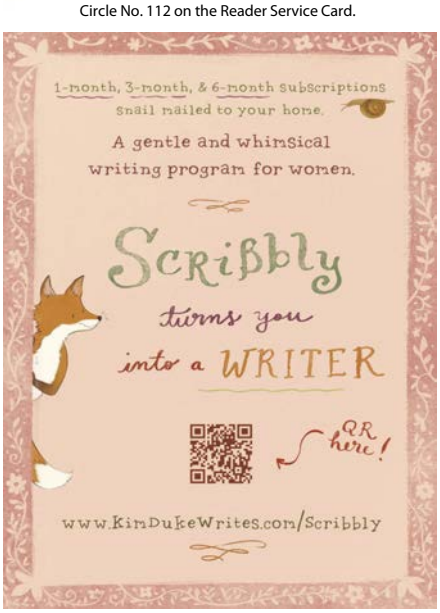

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Bonus
Flock Talk | by Ana Hotaling

Fungus Among Us

Fungi are unicellular and multicellular organisms that thrive throughout the world. They don't rely on photosynthesis for energy but rather derive their nutrition directly from absorption. They secrete enzymes onto the surfaces they grow on, absorbing the nutrients those enzymes digest.

Taxonomists have identified approximately 100,000 varieties of fungus and believe as many as 1½ million exsist in the world. While most of these are harmless to other living organisms, several aren't. In specific conditions — darkness, temperature, and humidity are all crucial factors — these fungi can produce toxins called mycotoxins that can cause disease and, in extreme cases, death amongst our chickens.

Unfortunately, it isn't easy to tell when a fungal disease affects our flock. Unlike viral or bacterial infections, fungal diseases for the most part do not cause such visible symptoms as sneezing, mucous discharge or lethargy. Diagnosis is usually done by microscope, often at the necropsy table.

If you sense a general unwellness amongst your flock, trust your instincts. Fungus may very well cause one of these five fungal conditions in your chickens.

AFLATOXICOSIS results from highly toxic mycotoxins produced by the fungi *Aspergillus flavus* and *Penicillium puberlum*. These toxins are collectively called aflatoxins. They can establish a tenacious, extremely stable existence in poultry feed.

Afflicted birds display a lack of appetite, an unsteady gait and a tendency to lie down. Anemia and black or bloody diarrhea may develop. Aflatoxicosis has a high mortality rate.

ASPERGILLOSIS is most commonly caused by the fungus *Aspergillus fumigatus*. It can affect all domestic and captivity-raised birds — your chickens, of course, but even zoo penguins are at risk. Younger birds are more at risk to this disease, which causes lesions in the lungs, air sacs and trachea, causing afflicted animals to gasp for air.

Chickens and pigeons may occasionally develop painful, itchy skin lesions as well as inflamed eyes. Aspergillosis will affect an entire flock versus a handful of birds, with a high mortality rate.

CANDIDIASIS, also known as thrush, is caused by *Candida albicans*, a saccharomycete fungus more commonly called yeast. *C. albicans* typically resides within the gastrointestinal tract of animals (including humans), participating in the digestive process and kept in check by the presence of beneficial bacteria.

Candidiasis typically occurs when long-term antibiotics have been used. These antibiotics not only kill off harmful bacteria but the helpful flora as well. This allows *C. albicans* to flourish unchecked.

Candidiasis can be identified by the thick, bright-white mucus that coats a chicken's tongue, mouth and esophagus. Oral mucus produces a characteristic strong, fruit-like odor. Fortunately, candidiasis can be treated with an antifungal, Nystatin, available via prescription from a veterinarian.

TRICHOTHECENE MYCOTOXINS is a group of toxins results from many different types of fungus, including Trichothecium, Trichoderma, Stachybotrys and Fusarium. Trichothecenes can adversely affect any animal, from chickens to humans.

These toxins are most commonly associated with spoiled grains such as oats, corn, barley, wheat and sorghum. When continually ingested by chickens, the mycotoxins cause weight loss, decreased appetite and a drop in egg production. Trichothecenes can cause cysts on birds' feet and legs, as well as ulcers in their mouths.

ZEARALENONE MYCOTOXINS are produced by such fungi as *Gibberella zeae*, *Fusarium cerealis* and *Fusarium crookwellense*. They are commonly found in improperly stored animal feeds and cereals.

Zearalenone exposure is pernicious. It is an estrogenic toxin, meaning it attacks the reproductive systems of the afflicted animals. Zearalenone's mechanisms aren't yet fully understood beyond the fact that it severely affects reproduction. Afflicted hens will experience a decrease in egg production and develop peritoneal and oviductal cysts, detected at necropsy.

To prevent dangerous fungi from reaching your flock, first and foremost, store your chicken feed in an airtight container in a dry environment. Humidity can encourage the growth of fungus. Never feed your flock any feed, scratch, kitchen scraps or other edibles that contain mold or appear clumpy or fuzzy. Dispose of these well away from where your flock ranges.

Establish a routine schedule that involves the thorough cleaning and sanitizing of all of your feeders, including feed lines and feed-storage containers. Buy your feed from a trusted source and regularly inspect your feed grains, especially corn.

If you live in a region known for high humidity, consider using feed additives such as zeolites, clays and propionic acid to control the growth of fungus in your feed.

Finally, frequently clean your coop. Replace moist, soiled litter with fresh, dry bedding to reduce the possibility of fungus establishing itself in your flock's living quarters.

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ONE COOL Coop

An important part of our chicken-raising strategy is to reduce environmental impact. Our chickens live at Double Creek, a small school in Portland, Oregon. The children designed and built the coop and do most of the chicken care. They have come up with great ways to make our backyard flock sustainable.

When constructing our coop, we used reclaimed wood, scrap roofing and mis-mixed paint, and reused stepping stones and cinder blocks. If we hadn't used these things, they would have ended up in the landfill.

We have taken to dumping our lawn clippings, leaves and other chicken-safe yard debris in their large run. It breaks down much faster and keeps the hens amused. We also supplement commercial bedding with shredded paper in their nesting boxes and coop. The older kids enjoy using the paper shredder and watching the paper turn back to soil.

Our chicken feeder is a 5-gallon bucket which was previously restaurant packaging for human food. We give our chickens water with a watering system made of scraps of PVC pipe attached to another 5-gallon bucket. The chickens enthusiastically consume our fruit and vegetable scraps. They also provide a great inspiration to get the kids weeding; the chickens love dandelions!

We regularly scoop out the coop and clean all the old bedding out of the small run every few months. The waste spends a year decomposing and then becomes rich fertilizer for our garden beds. The kids love planning and caring for our vegetable garden. They even plant chicken friendly plants just outside the run to offer shade and give the chickens a tasty treat.

Keeping chickens has been a great experience. The kids at our school have come up with many creative ways to reduce waste while spoiling our seven special birds. — *Joy Geren, Beaverton, Oregon*

SHOOT YOUR COOP!

Email us a short write-up (~250 to 500 words) about your chicken coop along with a few images to **chickens@chickensmagazine.com** with the subject line **One Cool Coop**, and include your name and mailing address.

We'll send one person a prize package of Frenzy Products (total approximate value $60): 30-ounce Mealworm Frenzy, 30-ounce Double Frenzy and Free Range Feast Spice Blend from our sponsor, **Happy Hen Treats** (**www.happyhentreats.com**)!

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If a winner doesn't respond within 72 hours, the email is undeliverable (sent three times over five days), if entrant is ineligible or doesn't accept the prize, the prize will be forfeited and the next runner-up will be selected. Acceptance of prize constitutes permission (except where prohibited by law) to use each winner's name, city and state where winner is located and likeness for promotional purposes without further compensation. **Prizes:** The prize to be awarded and the approximate retail value ("ARV") is five bags of naturally-grown hemp bedding from Eaton Pet & Pasture of ~$100 (Chicken Chat) OR package of Happy Hen Treats of ~$60 (One Cool Coop) OR Brinsea ChickSafe Eco Coop Opener at ~$100 (Shutterclucks). Winners are responsible for any taxes on prize. No substitution or cash equivalent permitted, except by Sponsor. Prize is nontransferrable. 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ЕЛЕНА ФАЕНКОВА/STOCK.ADOBE.COM

Mystery Breed Answer

The breed depicted on page 4 is the Barnevelder, which originated in the Barneveld region of the Netherlands. Breeders selected breeds that would lay well year-round, even during the long, damp Northern European winters. They were also looking to increase production of coppery, dark brown eggs. The breed was accepted into the American Poultry Association's Standard of Perfection *in 1991.*

Barnevelders have a bright-red single comb that stands straight and upright with five well-defined points. Wattles and earlobes are bright red. Males weigh 7 pounds; hens, 6. Learn more at Hobbyfarms.com/barnevelder.

To purchase other brown-egg layers, please visit **Murray McMurray Hatchery** *online at* **www.mcmurrayhatchery.com**.

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recipe & photos by Lori Rice

WARM POTATO SALAD *with soft-cooked eggs*

This picnic salad swaps hardboiled eggs for the jammy yolk of soft-cooked, then combines them with tender potatoes and crunchy bacon. It's dotted with leafy greens and dill and tossed in a lemon mayonnaise-mustard dressing. It can be served warm or at room temperature, and it's easily doubled when you need to serve a crowd.

YIELD: 4

INGREDIENTS

- 2 large eggs
- 3 slices thick-cut bacon, chopped
- 1 pound baby potatoes, halved or chopped into similar size pieces
- ½ cup diced green bell pepper, about half a medium pepper
- 1 tablespoon chopped fresh dill
- 2 tablespoons mayonnaise
- 1 teaspoon spicy brown mustard
- 1 teaspoon fresh lemon juice
- ½ teaspoon fine sea salt
- ¼ teaspoon ground black pepper
- handful of watercress leaves, about ¼ cup
- ground black pepper and dill sprigs for garnish

PREPARATION

Fill a medium saucepan with water, and bring to a boil over medium-high heat. Gently transfer the eggs to boiling water and cook at a low boil for 6½ to 7 minutes. Remove the eggs from the cooking water, rinse with cold water and set aside.

Heat a large nonstick skillet to medium-high, and cook the bacon until the pieces are browned and crisp, about 7 minutes. Turn off the heat, and transfer the bacon to a bowl, leaving behind the bacon grease.

Place the potatoes in the warm grease, cut-sides down. Return the heat to medium-high. Cook until all sides are browned and the potatoes are tender, about 7 minutes. Transfer the potatoes to a medium bowl. Let cool for 5 minutes.

Add the bacon, green pepper and dill to the bowl. In a small dish, stir together the mayonnaise, mustard and lemon juice. Pour the dressing over the potatoes. Add the salt and pepper. Stir well to coat all ingredients with the dressing.

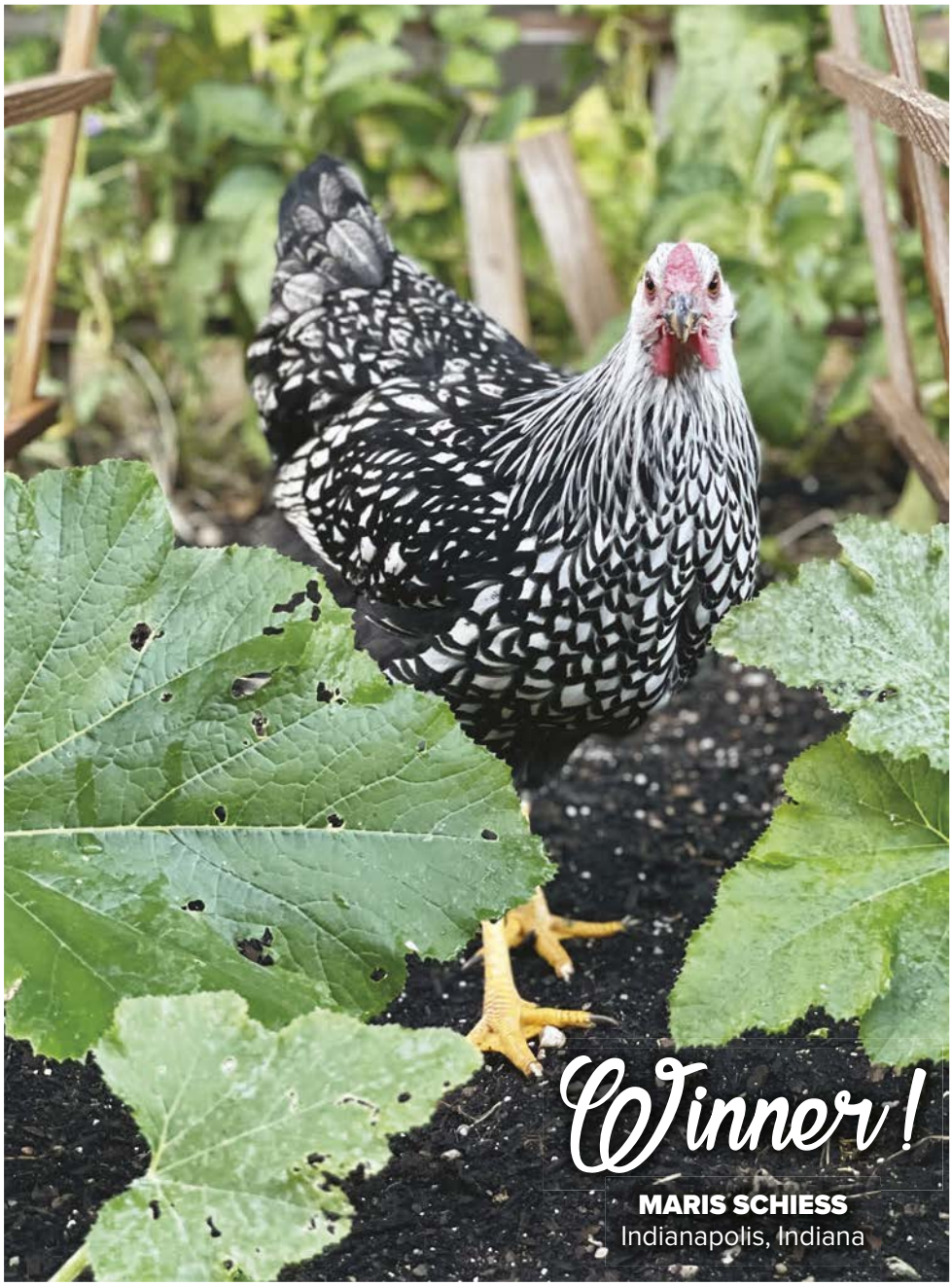
Peel the eggs, and halve each. Transfer the dressed potato salad to a serving dish. Top with watercress leaves. Arrange the egg halves over the potatoes. Garnish with black pepper and dill. Serve warm or at room temperature.

Lori Rice is a writer, photographer and nutritional scientist. Her love of agriculture led to her past work in cooperative extension and to her current passion for capturing the story of small-scale food production through her writing and photos. You can find her portfolio at www.loririce.com.

POTATO'S PLACE IN HISTORY

According to food writer Susan Russo, the earliest written recipes for American potato salad date to the mid-19th century. "Cooked potatoes were typically dressed with oil, vinegar and herbs, which culinary historians believe were introduced by German immigrants who had a penchant for sour, sweet and spicy ingredients such as vinegar, sugar and coarse mustard," she wrote in a blog post for National Public Radio. "Hot potato salad, usually made with bacon, onion and vinegar dressing, was so closely associated with German immigrants that it was called 'German potato salad.'"

Shutterclucks



SHARE YOUR PICTURES!

Email an image of your chicken(s) to **chickens@chickensmagazine.com** with the subject line **Shutterclucks,** and include your name and mailing address. Or you can enter online at **www.hobbyfarms.com/shutterclucks**.

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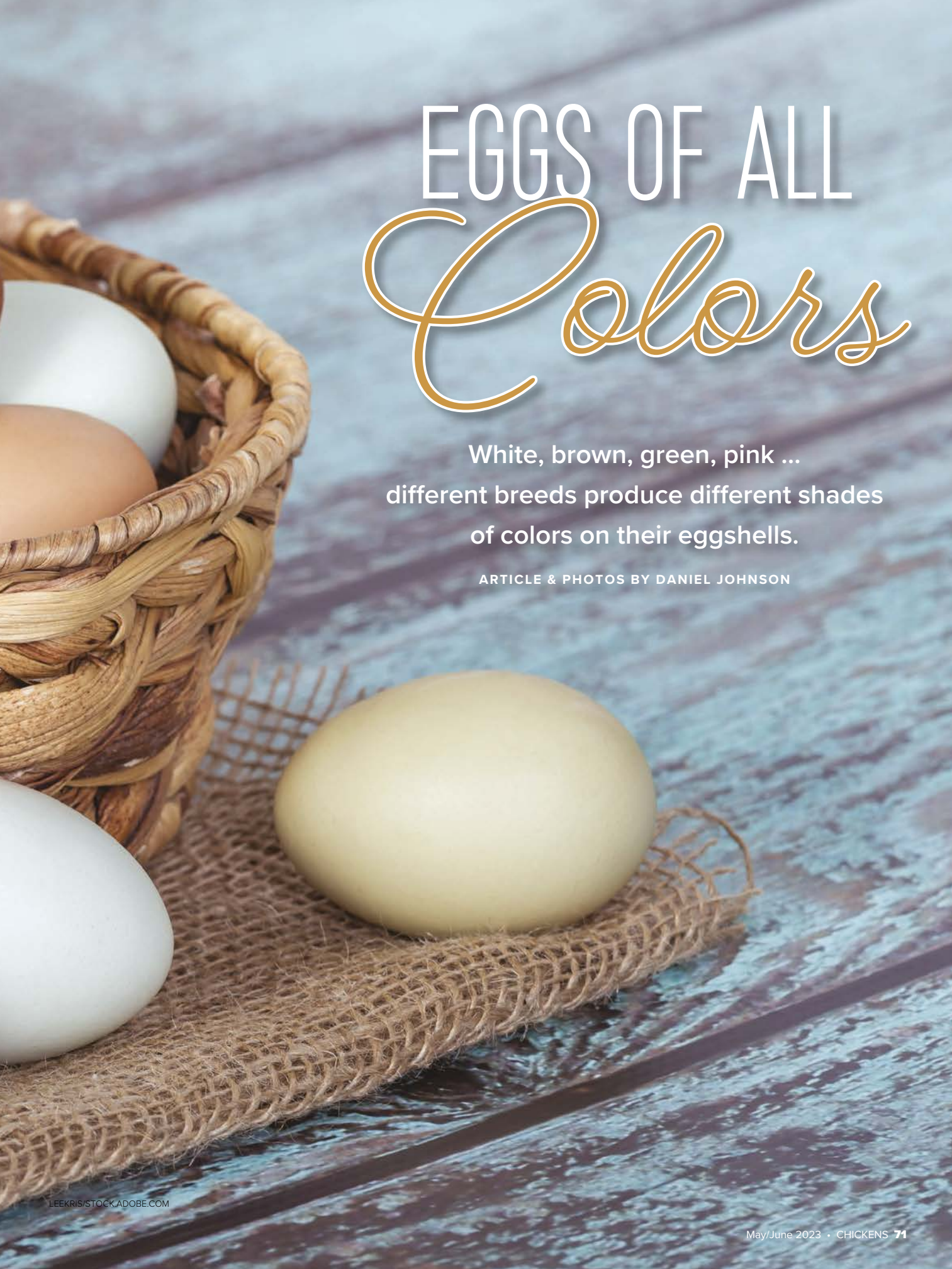
EGGS OF ALL *Colors*

White, brown, green, pink ... different breeds produce different shades of colors on their eggshells.

ARTICLE & PHOTOS BY DANIEL JOHNSON



LEEKRIS/STOCK.ADOBE.COM

In some modern supermarkets, fresh foods tend to be a bit predictable. Produce may be limited to a small number of common hybrid varieties, with many beloved heirloom fruits and veggies absent. The same is often true of eggs. While you can probably find brown eggs, it's usually the standard white eggs that prevail on the shelves.

In both instances, the reason is the same: Grocery shelves are usually stocked with a particular variety that is favored by the masses and easy to mass produce. For chicken eggs, this often means that the White Leghorns supply the majority. But on your hobby farm, options don't need to be so limited.

No other heavy breed lays more brown eggs than the Rhode Island Red.

Taster's Choice

It somehow seems logical that if different colored eggs look different from each other, they might also taste different. But it just so happens that this idea doesn't pan out. While a hen's age, environment and diet can conceivably affect the nutritional value or even subtly affect the taste of an egg, the color of the shell itself really doesn't have an impact on the taste.

When you're simply looking to keep your family and friends stocked with farm-fresh eggs, the commercial-level egg production qualities of the leghorn may not be as important as other breed factors. This frees you up to focus on other qualities such as climate hardiness, meat production in dual-purpose breeds and, if you want, egg colors.

Of course, there's nothing wrong with white eggs, and while you might not want to choose a chicken breed solely for a specific egg color, there's also nothing wrong with adding a bit of joy and atheistic charm to your farmhouse kitchen with a rainbow of shell colors. But to get colors, you need the right chicken breeds, so here are 11 that will deliver eggs in colors other than white.

RHODE ISLAND RED: BROWN

If you like brown eggs, and you like a lot of eggs, you can't skip over the Rhode Island Red. With some hens producing well into the range of 200 to 300 eggs per year, you can count this attractive and very friendly chicken to keep you well supplied.

Keep in mind that there are two subvarieties of this breed — the more commercially viable industry variety and the hobby farm-friendly heritage variety, which functions nicely as a dual-purpose bird for meat.

PLYMOUTH ROCK: BROWN

Another prolific egg producer with brown eggs is the Plymouth Rock. It's such a good layer that it was one of America's biggest egg producers prior to the general industrial move toward the leghorn.

It's an easy bird to have around the farm, lays about 200 eggs per year, and what's not to like about those amazing black-and-white feathers?

AMERAUCANA: BLUE

Technically, the eggs of Ameraucana chickens are considered blue, but it's a delightful sea blue with a dose of pastel green mixed in. This breed was developed in the United States from the South American Araucana chicken (which also lays blue eggs).

Araucanas possess interesting ear tufts. However, the genetics for this trait sometimes results in a lethal allele (an alternative form of a gene that arises by mutation) that can greatly reduce hatch rates, so the Ameraucana was developed to keep the blue eggs but eliminate the lethal allele. Ameraucanas even have blue legs! They're docile birds but not very common, so you might have to do some searching to find a breeder.

Hens that lay colored eggs, secrete pigments, called porphyrins, from cells within the uterus to add color to their eggshells during the last five hours of shell formation.

More Birds, More Choices

If you're a true fan of colored eggs, explore other poultry species as well. You'll find more colors, fun patterns, textures and sizes. Look for boutique eggs at a local farmers market, or consider raising these birds yourself. At any rate, there's plenty to like about:

QUAIL EGGS. Small, charming and absolutely speckled with brown spots from small to large, quail eggs are a fun choice. They're sometimes considered a delicacy.

DUCK EGGS. For cooking purposes, a single duck eggs equals about two chicken eggs, and they're simply loaded with nutrients and deep creamy flavor. Plus they come in several colors including white, brown, black and some pleasant pale shades of blues and greens.

TURKEY EGGS. Always a light color, with wonderful brown speckling, turkey eggs are just as edible as these others and are pretty large, too!

EMU EGGS. Surprisingly large, with a unique texture and a rich, deep bluish-green color, emu eggs are sure to amaze! Emus are also hilariously entertaining to watch.

Ameraucanas (above) are known for their beautiful blue eggs.

Easter Eggers (right) lay a wide range of colored eggs, from blues, greens and even pink.

MARANS: DARK BROWN

The Marans, named after the town of Marans, France, is notable for laying dark brown eggs. There are plenty of subvarieties in the Marans chicken breed, but the Black Copper Marans produces really dark brown eggs. The coloring is very striking.

This can be a lot of fun, especially if you have other chicken breeds in your coop and can create an assortment of color shades in your egg basket. Marans are cold hardy and an excellent choice for regions with chilly winters.

WELSUMMER: BROWN WITH SPECKLES

Turkey eggs have brown speckles, but you can also get a similar effect from Welsummer chickens. It's a fun way to enjoy an additional pattern on your eggshells.

Plus, there's plenty to love about Welsummer chickens in general: hardiness, docility and excellent meat qualities in addition to the cool eggs.

EASTER EGGER: BLUE, GREEN, YELLOW & MORE

You wanted unique shell colors, and this is your chance! Depending on the specific hen, an Easter Egger chicken can provide you with light blues, fun greens, browns, yellows and

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Marans hens (Black, right) are well-known for laying dark brown, almost chocolate-colored eggs.

occasionally even pink eggs, although the colors are very pastel.

Just be aware ahead of time that Easter Eggers are a "designer" chicken, or more simply, a mixed-breed, in the same vein as a Goldendoodle or Yorkipoo in the dog world. This means that you might see a wider variety of breed traits from chicken to chicken, and you also wouldn't be able to show them at fairs or poultry breed events.

OLIVE EGGER: GREEN

If you're looking for green eggs specifically, you can usually do it with your own breeding experiments. You just have to cross a blue-layer like an Ameraucana with a brown-layer such as a Marans.

As with the Easter Eggers, the downside here is that you're moving into unknown territory when it comes to the rest of the offspring's traits; you don't know exactly what you're going to get and any resulting chicks won't breed true. But it's nevertheless a method for obtaining green eggs. (Now you just need some ham, right?).

ORPINGTON: BROWN

Developed in England during the late 1800s as a solid dual-purpose breed, the Orpington is a fast-maturing chicken that's a great layer or can be used as a meat bird. The attractive Buff coloring results in a striking bird with a wonderful golden color.

Egg colors can range from light to dark brown.

PENEDESENCA: RED/BROWN

This is a Spanish-bred chicken with a high heat tolerance, so it might be a good choice for

Shell Game

Wondering just what causes a white egg, a brown egg or other colors? The quickest answer is: simple genetics. For purebred birds, this is entirely predictable and consistent; for the Easter Eggers, things are a bit of surprise but the egg color is still based on the genes the individual bird inherited.

In addition to breed genetics, you can sometimes get a clue to what color eggs a hen will produce by examining her earlobes — red earlobes for brown eggs, white earlobes for white. Finally, a couple of pigments are produced by the hen to actually "paint" the eggs while they're in the formation process; the oocyanin pigment creates blue and green eggs and permeates the eggshell, making eggs blue/green inside and out. Protoporphyrin is a brown pigment applied late in the egg-formation process and simply coats the shell without affecting the yolk or egg white.

A mixed-breed flock — Marans (Cuckoo, left) and Ameraucana (right) — will produce a rainbow of colored eggs.

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Buff Orpington hens (above) produce around 200 to 280 large brown eggs per year.

homesteaders in southern regions. They also lay eggs with a unique reddish tint mixed with a very dark brown base.

BRAHMA: BROWN

If you'd like to try a large chicken, check out the brown-egg-laying Brahma, which tops out at a healthy 10 to 12 pounds! They're good layers even in the winter, so you can invest in them to help extend your laying season even when other hens have stopped.

PAULETTE JOHNSON

You can expect Plymouth Rock hens (right) to produce about four light-brown eggs each week.

CREAM LEGBAR: BLUE

Developed just over 100 years ago and derived at least in part by the blue-egg-laying Araucana, Cream Legbars also produce eggs with that lovely blue color that is so unique.

Cream Legbars are also pretty useful for poultry producers as male and female chicks are easily distinguished after hatching. They're excellent foragers and good in a free-range situation.

And there you have it: eleven beautiful chicken breeds that can add a dash of color to your morning egg collecting routine. Have fun!

Daniel Johnson is a freelance writer and professional photographer whose photos have appeared thousands of times in books, calendars, and magazines. He's the author of several books, including How to Raise Horses: Everything You Need to Know *and* The Beginner's Guide to Beekeeping: Everything You Need to Know. *When not working, he enjoys spending time with his four horses.*

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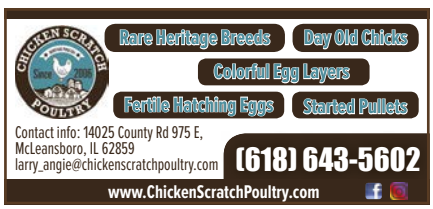

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LAST Squawk

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— HENRY WARD BEECHER (1813 – 1887) AMERICAN CONGREGATIONALIST CLERGYMAN

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